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HEREDITARY SYPHILIS AS A CAUSE OF CHRONIC INVALIDISM

AND THE DIAGNOSIS BY INTENSIVE FAMILIAL STUDY*

HENRY FARNUM STOLL, M.D.

Visiting Physician to the Home for Crippled Children, Newington; Assistant Physician, Hartford Hospital; Physician-in-Chief, Syphilis Clinic, Hartford Dispensary

HARTFORD, CONN.

There is scarcely a symptom to which man is heir that may not be caused by the *Spirochaeta pallida*.

With the development of delicate laboratory tests the field is ever widening, and the syphilitic yardstick has been applied to practically every syndrome, with the result that we have been forced to change many of our ideas, and the end is not yet.

For many years certain clinicians have realized that syphilis is a disease of the family rather than of the individual; but it was not until the advent of the Wassermann test that it was appreciated how extensive prenatal infections are and that an apparently healthy child may harbor the organism.

Time causes certain changes in the spirochete in vitro; for example, the organism from a primary sore produces a lesion in a rabbit's testicle in from two to three weeks, while that obtained from general paresis requires three or four times as long to develop.

In like manner the symptoms occurring from twenty to thirty years after infection — especially prenatal infection—are often insidious of onset, vague and indefinite in their development, and quite frequently unaccompanied by physical signs. To obscure the condition further, the Wassermann test, so valuable in early syphilis, is only rarely positive in adults with hereditary syphilis.

For several years I have been interested in the study of syphilitic families; their symptoms have been analyzed, their physical signs tabulated whenever possible, and Wassermann tests made on many. I have been greatly assisted in this work by Miss Barry of the Hartford Visiting Nurses Association and Miss Goldberg at the Hartford Dispensary.

As a result of a more or less complete study of approximately 100 families, it has seemed to me that if one groups together all the symptoms and physical signs of all members of the family, certain syndromes will often be found that are quite suggestive of what might be termed familial syphilis.

The individual with tuberculosis usually presents a combination of symptoms and physical signs that are more or less typical of the disease. In "late" hereditary syphilis, however, the patient may present no sign of syphilis and but a single obscure symptom which may be so distressing that a more or less complete invalidism results. But suspicious symptoms and perhaps conclusive physical signs may be found in other members of the family, and in this way a wholly indefinite and meaningless symptom, like one piece of a picture puzzle, may become highly significant when fitted into its right place in the family syndrome.

I judge that the diagnosis of hereditary syphilis by intensive familial study is not generally practiced, as no mention was made of it in four symposiums which I recently attended in which many well known syphilologists discussed the various problems of syphilis.

Family histories as commonly taken are entirely worthless in deciding for or against the possibility of familial syphilis. It takes a good deal of time to elicit all the facts; but not infrequently the information thus gained furnishes the only means of clearing up an obscure case.

Within a few days I examined a man whose father was stated to have died as the result of an accident. Inquiry developed that the accident was a gunshot wound through the mouth from which he made a good recovery, living many years thereafter and leading an active business life. About ten years before he died he developed some spinal trouble, which was attributed to his previous injury. He lost the use of his legs and got about only in a wheel-chair. This suggests that he may have had tabes, which would explain the high narrow palate I observed in his son and quite possibly the cerebral endarteritis from which he was suffering.

Before attempting to work out various syndromes of familial syphilis, one must first appreciate what diseases in a parent are indicative or highly suggestive of syphilis. We are justified in assuming syphilis when a parent has had tabes or paresis; as probable syphilis a history of aneurysm or aortic disease, and death from apoplexy and sudden heart failure before 50; as possibly syphilitic, cardiovascular renal deaths up to 60 or perhaps beyond. I also believe we are justified in at least suspecting syphilis in the presence of severe chronic headaches not relieved by glasses. The parents may be living and said to be well; but a paralysis of the third or sixth nerves, insomnia, extreme nervousness or "rheumatism in the legs" should awaken our suspicions.

The second family cited illustrates the importance of minute inquiry as to the health of maternal aunts and uncles.

What is often referred to as the typical sequence of syphilitic pregnancies, namely, miscarriages, stillbirths, premature syphilitic children and finally healthy children, has in my experience been encountered only

* Read before the Section on Nervous and Mental Diseases at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

rarely. While syphilis is the most common cause of abortion, it should be realized that in certain syphilitic families all the pregnancies may result in living children. Syphilis is also a frequent cause of sterility; this seems especially liable to occur in the "weakling" group of heredosyphilitics. One should bear in mind that hereditary syphilis may have the same effect on the fetus that acquired syphilis has.

When pregnancy results in a syphilitic, one of several things may happen:

1. The fetus dies, and abortion or stillbirth results. This is usually attributed to a uterine malposition.

2. The fetus does not die, but is expelled prematurely.

3. The child may (*a*) present obvious evidence at birth or within a few weeks, or (*b*) appear healthy for several years and then develop some syphilitic manifestations, as interstitial keratitis or a bone lesion.

4. Occasionally a healthy child is born to syphilitic parents whose disease is in a latent condition.

5. The child may exhibit certain stigmata, the result of protoplasmic disturbances, even when no infection occurs. I have had as patients two men with acquired syphilis with high narrow palates who were the sons of syphilitics. These dystrophies or alterations of the normal development of the germ plasm may be accompanied by a real congenital syphilitic infection. The

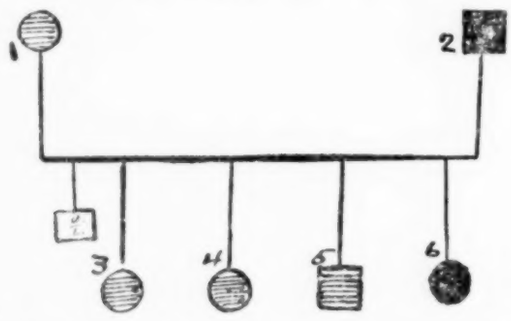

Chart 1.—Heredity chart, Family 1. In the charts, squares indicate male, and circles, female; all black, syphilis known to have been present (except Chart 5, where solid black indicates epilepsy); shaded, probable syphilis; triangle, miscarriage; double triangle, stillbirth; *d. i.*, died in infancy; *H*, headache; *TB*, tuberculosis; *A*, alcoholic; *N*, nervous; *S. P. U.*, sequence of pregnancies uncertain. In the legends, *a* indicates alive and *d*, dead. 1, *a*, alcoholic; headaches; 2, *d*, tabes dorsalis; 3, *a*, nervous; 4, *a*, nervous; severe headaches; 5, *a*, very nervous; 6, *a*, chronic headache; spondylitis.

common dystrophies are the high narrow palate, hare lip, scaphoid scapulae, short arms, hypoplastic teeth, etc.

6. We should suspect the possibility of hereditary syphilis in individuals whose chief characteristic is a constitutional inferiority. As children they "took" everything and were always very ill. Even when not definitely sick they were ailing and "hard to raise," yet without definite reason. Usually nervous and irritable, frequently complaining of headache, they are prone to develop tuberculosis which is apt to be fatal. Often a very thorough examination will reveal a suspicious sign, though sometimes we will find only the telltale dystrophy or symptom in a brother or sister.

It would be a very grave mistake to assume that all delicate children are heredosyphilitic. Nevertheless I am sure that too little attention has been paid to this particular disease as a cause of "weaklings."

As illustrative cases I have purposely chosen several who were free from the usual stigmata of hereditary syphilis and who had negative Wassermanns. Most of my tests were made in our state laboratory at Middletown. A few, however, were made in reliable laboratories in New York and Philadelphia, and they too were negative.

The luetin test was positive in nearly all of the cases, but inasmuch as the specificity of this test has been seriously questioned in patients who have received potassium iodid, the results are not recorded, as nearly all had received this drug.

I personally feel that an intensive familial study of the supposedly nonspecific reactions will materially diminish their number.

REPORT OF CASES

CASE 1.—An unmarried woman of 26 (No. 6, Chart 1) complained of severe headaches from which she had suffered since earliest childhood. She was referred to me by Dr. Paul P. Swett, to whom she had been referred because of pain and tenderness of the upper cervical vertebrae. Dr. Charles A. McKendree, under whose care the patient was for a time at Cromwell Hall, kindly allowed me to supplement my history with his notes. She had been very strong as a child, but her headaches dated from her earliest recollection. She had always been of an excitable temperament, quick and irritable. The headaches were so severe when the patient was 15 that she was forced to leave school, and consulted a number of eminent men in Europe after failing to obtain relief in this country. Each summer for the past thirteen years she had gone abroad, as the ocean trip helped her considerably. Two years ago a well known specialist in London did an extensive operation on the interior of the nose for the relief of the headaches, but without success. A roentgenogram revealed a tooth that had failed to erupt, and with the hope of obtaining relief it was removed, but no improvement followed.

The circumstances of the patient were such that she was able to consult many specialists of renown. Several Wassermann tests had been made, but all were negative. One neurologist had recently told her he was sorry her blood was negative, as otherwise he could have given her treatment. "I know you will be disgusted," he told her, "to have me say it is just 'nerves'." An interesting fact was elicited, however. Several years ago while in Germany a physician injected some medicine into her hip, and following this treatment her headaches were very much better for a time.

Recently she has complained of paresthesia of the postcervical region; her sleep has been interfered with by nervousness, and pains in her neck which required her to frequently change her position. In the morning she is not rested. Her mother states that her condition is the result of her being a "spoiled child and growing too rapidly." Her nervousness was supposed to have been an inheritance from her mother, and her mother's nervousness was induced by the worry and strain of her husband's long illness—a highly reasonable explanation. What were the grounds for suspecting syphilis? Out of a group of 100 people she would have been the last one suspected of having hereditary syphilis, as far as her appearance went. She was a strikingly handsome woman, very tall and mentally alert. Her unusual height—she was over 6 feet—recalls to mind that Fournier, who recognized the syphilitic origin of tabes and paresis many years ago, likewise stated that gigantism and dwarfism were commonly the result of hereditary syphilis.

Dr. Swett found considerable thickening and marked restriction of lateral movement of several cervical spines, which he diagnosed as a probable specific spondylitis; otherwise the physical examination was negative.

The patient was the fourth of five children. One died in infancy. Two married sisters and a bachelor brother are very nervous. One of the sisters is exceedingly so, and also suffers severely from headaches, spending a large part of her time in various institutions taking cures. The provisional diagnosis of hereditary syphilis would probably not have been made, however, except for the fact that her father (No. 2, Chart 1) had died at 47 from tabes, from which he had suffered for twelve years.

Her mother (No. 1, Chart 1), who is living, formerly suffered from headaches, and is addicted to alcohol.

Notwithstanding her negative Wassermanns and inconclusive luetin reactions, she was given injections of mercuric salicylate by Dr. McKendree and subsequently by her physician in New York, with marked relief of her symptoms.

Had the father died of some acute illness or an accident before tabes had been recognized, the chief key to the problem would have been lacking; yet the extreme nervousness in the brother and sister should suggest their careful examination for some dystrophy of hereditary syphilis.

Two years ago I reported a similar case; a man, aged 36, whose father had tabes, obtained complete relief from severe headaches and many neurasthenic symptoms following salvarsan and mercury, though his Wassermann was constantly negative. A third case has recently been seen. A middle aged woman whose father had died from tabes experienced great relief from headaches of years' duration following specific treatment. She also had a negative Wassermann.

CASE 2.—A married woman of 37 (Chart 2, No. 15) complained of burning and pressure on the top of her head and of a burning at the tip of her tongue, which symptoms had been present for ten years. For many years her endurance had been poor, and often after the day's work she would have to let her hair down because the burning and pressure on the top of her head was so severe. Sometimes she would suffer from slight vertigo. Her discomfort was especially marked at the time of menstruation. For years she had been more or less disinclined to social activities because of general weakness and the above mentioned symptoms. She had been assured that they were due to "uric acid poisoning," and had been on a meat free diet for the past year. No relief, however, followed this abstinence from meat. Her only pregnancy had resulted in a miscarriage.

The patient was a large, fine looking woman presenting no stigmata whatsoever of hereditary syphilis. Physical examination was negative except that there was a slight hypertension—systolic blood pressure 140. The urine contained the smallest possible trace of albumin. The Wassermann was negative. The family history at first appeared to be entirely negative. Her mother died of cardiac dilatation following pneumonia, her father from a tumor of the throat. She has two living sisters, one in good health, the other a semi-invalid from "too much uric acid." Two brothers are living and well, and a brother died from heart disease. Certainly a negative family history. A different picture is obtained, however, when one makes an intensive study of the brothers and sisters and of the preceding generations. In the first place, the sister who suffered from "uric acid poisoning" (No. 14) had a systolic blood pressure of about 260. The other sister (No. 13), who appeared well, had a systolic pressure of about 170. Both had negative Wassermanns. The latter as a child had an ulcer of the rectum which healed slowly and left a stricture. One living brother (No. 17), who was not examined, is stated to suffer from a chronic "sore" near the anus and periodically the soles of his feet "peel off." A third brother (No. 18), is apparently in good health. The brother who died suddenly at 16 of heart disease (No. 16), had never suffered from "rheumatism," which is suggestive of syphilitic myocarditis. The mother had four unmarried sisters and one brother. One sister (No. 5) was found to have hypertension and had had several strokes of apoplexy. A second (No. 6), is apparently in good health; a third (No. 8), who was a seven months baby, was not examined, but is said to suffer a great deal from dyspnea, which is suggestive of cardiovascular disease. The fourth sister (No. 7) died at 38 of heart disease. She was unmarried and had not had rheumatism. A maternal brother (No. 4) died at the age of 17 of apoplexy. There were also one miscarriage and two stillbirths.

In the preceding generation, that is, the grandparents of the patient with the burning tongue, the grandmother (No. 1) died at 64 of apoplexy and the grandfather (No. 2), at the same age of "fatty" heart. It is extremely suggestive that the cardiovascular disease which was present in three generations was due to syphilis.

The patient with the burning tongue and pressure on the top of her head was put on injections of mercury and potassium iodid, and promptly and completely recovered from her symptoms, which have not recurred for a period of two and one half years. Since the treatment she has become the mother of twins.

CASE 3.—An unusually alert, keen man of 30 (No. 11, Chart 3), became dazed while riding in the cars one day. On reaching home he vomited and had several severe convulsions, involving his whole body. For several days thereafter he was completely disoriented; then for a number of weeks he was listless and disinterested in his affairs, and from time to time he was exceedingly nervous. During the succeeding months he had many momentary lapses of consciousness. He would be talking with a man, and suddenly realize that this man had left and another had taken his place, but he had no recollection of the one leaving or the other coming in. Once at dinner when a plate of food was passed to him he asked "what is this for?" but instantly realized it was his dinner.

For a year prior to this illness he had been under a peculiarly severe nervous strain. Two or three times in previous years he had some sort of brief sickness apparently depending on constipation, from which he suffered. He was a slender, enteroptotic type of individual presenting no signs of hereditary syphilis. (The scapulae were not noted.) He gave a negative Wassermann at two different laboratories, and his spinal fluid was reported as negative. The Lange test was not done. Nevertheless, from an intensive study of the family history, I felt that the underlying cause of his attacks of

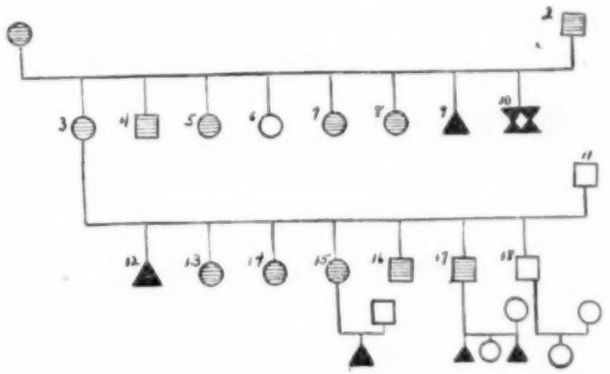

Chart 2.—Heredity chart, Family 2: 15, neurasthenic, aged 39, Wassermann reaction negative; 13, *a*, 39; hypertension; stricture of rectum as girl; Wassermann reaction negative; 14, *a*, 43; hypertension; Wassermann reaction negative; 16, died at 16 of "heart disease"; no rheumatism; 17, *a*, 37; not examined; a "sore" near anus; periodically "sheds" skin of soles; 18, *a*, 36; apparently well; Wassermann reaction negative; 3, *d*, 50, mother of preceding; cardiac dilatation following pneumonia; 4, mother's brother; died of "apoplexy" at 17; 5, sister, died at 38 of "heart disease"; no rheumatism; 6, *a*, 63; hypertension; several strokes of apoplexy; Wassermann reaction negative; 7, *a*, 60; apparently well; Wassermann reaction negative; 8, *a*, 58; was a seven months' baby; not examined; from history, probably hypertension; 10, stillborn twins; 1, maternal grandmother of 15, died at 64 of apoplexy; 2, husband of 1, died at 64 of "fatty heart."

petit mal was probably hereditary syphilis, and advised specific treatment.

The father died at 52 (No. 2) of pneumonia. The mother (No. 1) had hypertension for years, dying of uremia at 70.

In the first place it is significant that out of thirteen pregnancies four were miscarriages and four died in infancy. The oldest son (No. 3) escaped a prenatal infection only to acquire one later in life. The oldest daughter (No. 7) appeared to be well, but was not examined. The next oldest, an unmarried woman of 40 (No. 8), is said to have been delicate as a child. It is noteworthy that the pregnancy preceding the birth of this child resulted in a miscarriage and that three of the four succeeding pregnancies were likewise miscarriages; the fourth child died in infancy. At 12 she was very anemic. In her school work she was not up to grade, as she had difficulty in "grasping things," as she expressed it. For this reason a private tutor was provided, but she made very little progress because she was unable to concentrate her attention on what her teacher was saying. At 24 years of age she had a very severe attack of "nervous prostration." She cried much at this time, and thought people were talking about

her, making unjust accusations against her character. She spent a month in bed, and ever since she has been extremely sensitive about being with people and has been more or less of a recluse. Nine years ago while on a shopping tour her legs began to tremble. She was taken home and was given a hypodermic and the twitching disappeared in about half an hour. For about six months the left side of her face would twitch; it was called "chorea."

Menstruations have been normal but for about a year were preceded by an uncontrollable attack of "ugliness," as she described it. At these times she could not control herself, and several times she has required morphin. She is considered incapable in the household, and is not able to assume any responsibility. Her acquaintances consider her "peculiar." The family appears to be of the opinion that she is naturally disagreeable, and that if she really tried she could be like other people. She has been almost constantly under the care of a nerve specialist. The last few years she has been less nervous, though she is still far from normal. She is a tall woman, and appears to be in good health. It was not possible to make a physical examination. The Wassermann reaction was two plus (50 per cent. inhibition).

Chart 3.—Heredity chart, Family 3: 1, hypertension, died at 70 of uremia; 2, died at 52 of pneumonia; 3, hypertension; diabetes; acquired syphilis; 4, 5, 6, 9, died in infancy; 7, *a*, well; not examined; 8, *a*, 39, chorea; retarded development; Wassermann reaction + +; 10, *a*, 34, neurasthenic; visceroptosis; general pains; prematurely old; Wassermann reaction negative; 11, *a*, 30; petit mal; Wassermann reaction negative; spinal fluid negative.

The next youngest brother, aged 34 (No. 10), has always been a weakling. I first saw him in May, 1911, at which time he complained of stomach trouble and dizziness with gas after meals, and suffered with constipation. His tongue was "parched on awakening" and while he did not belch, he had a "continuous flow of foul gas" and also "trembling in his stomach." He was also a slender enteroptotic individual, sallow of complexion, delicate in appearance and with all the earmarks of a neurasthenic. He was put on a diet for constipation, given olive oil injections and exercises, and he improved considerably. For a time he had some mucus in his stools accompanied by cramps, but this finally disappeared. His whole demeanor, however, was one of listlessness, and he goes about most of the time as though in a trance. He is prematurely gray, and looks careworn and old.

It did not occur to me that he might be a heredo-syphilitic when I first saw him five years ago, for at that time, in common with most physicians, I thought syphilis always wore the scarlet letter. His Wassermann reaction was negative a year ago, but he was put on mixed treatment, and at the end of three weeks his older sister volunteered the information that she had "never seen such a change in any one in such a short time." She said, "He is awake in the morning at the table; he reads the paper, seems alert and complains of no aches or pains. Prior to this his only conversation had been about his ill health." She also stated that he would go to business where formerly after breakfast he would sit down and go to sleep. She seemed to think there was some possibility that he might amount to something in business, so great was his improvement. The youngest son, the patient who suffered from the attacks of petit mal, has already been described. He was seen by two New York consultants, a neurologist and a syphilologist both of national repute, who saw no reason for assuming a syphilitis basis for the attacks; "Were not all the tests negative?" Quite naturally this family passed from my observation.

CASE 4.—A married woman aged 35 (No. 20, Chart 4), complained of extreme nervousness. As a child she was very nervous, and would often awake screaming at night, fearing some one was in her room. Only when her father slept in her room, between her bed and the door, was she reassured. In childhood she suffered from pain in her right leg. This pain was always along the shaft of the bone, and never in the joint. For one year she had daily massage without benefit. Mud baths and hot salt rubs were also tried, but with no relief. Part of the time she was under the care of the physician to the royal family of Sweden. Tuberculosis of the bone was diagnosed, and when she was about 12 years old several operations were performed on the right leg below the knee, and also above the ankle and along the femur. She continued to have pains in her right leg, however, which were always most severe at night. For years she has slept poorly, partly because of nervousness, but largely as a result of the "rheumatism" in her leg. Walking about would often stop these pains, and nearly every night for years she has gotten up and walked the floor, often dozing off while walking, and waking as she stumbled over something. She had very poor endurance and occasional night sweats.

Six years ago, as the result of a fall, the right knee was injured and the patella is now firmly adherent to the tibia. The patient was so nervous that it was difficult for her to give the facts of her history. She presented no signs of hereditary syphilis. Teeth, palate and scapulae were normal. The pupils also were normal; left knee jerk very active, right not obtained, owing to the deformity resulting from the injury six years ago. There were several scars along the right femur and the tibia and over the lower third of the tibia tenderness was elicited.

The history, then, was that of a very nervous child with some disease of the bones of the right leg. This child developed into an unstable, nervous woman who slept poorly, complained of weakness, pain in her right leg and occasional night sweats. This was not the history of hereditary syphilis, surely, nor did the physical examination suggest it. The family history, moreover, is chiefly remarkable in that a large number died of tuberculosis ("TB," Chart 4). Her mother, maternal grandmother, maternal aunt and two uncles, two sisters and two brothers had all suffered from tuberculosis. Questioning, however, developed other symptoms that could not be attributed to tuberculosis.

While her mother (No. 3) died from tuberculosis, she suffered for many years from such headaches that she frequently would say she could stand the cough if the headaches would only stop. The mother's sister (No. 4) also had severe headaches, as did the maternal (No. 1) grandmother. Among her own brothers and sisters four are exceedingly nervous (9, 17, 18, 19), one has severe headaches, one strabismus, another was blind for several months (keratitis?), another is very myopic, and three have been alcoholic since early life (Nos. 9, 16 and 19).

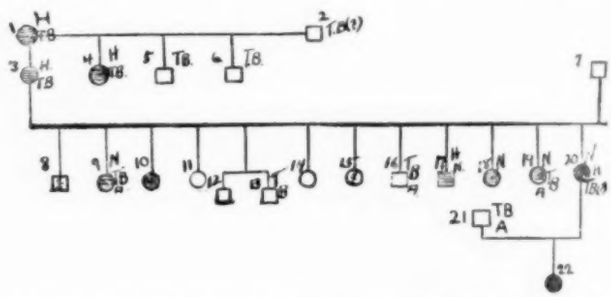

Chart 4.—Heredity chart, Family 4: 1, severe headaches; died at 60 of tuberculosis; +; 2, *d*, tuberculosis (?) "old man"; 3, severe headaches; tuberculosis at 30; died at 64; 4, headache; died of tuberculosis at 60; +; 5, 6, died of tuberculosis; 7, *d*, 60, cancer of the stomach; 8, 15, died in infancy; 9, chorea; extremely nervous; strabismus; alcohol; died at 45 of tuberculosis; 10, *a*, 50, blind several months; 11, very myopic; died at 4 of "tumor"; 12, alive, well; 13, *d*, tuberculosis; 14, *d*, "tumor of neck"; 16, *a*, tuberculosis; alcohol; 17, *a*, very nervous; "terrible headaches"; 18, *a*, very nervous; 19, very nervous; alcohol; died at 19 of tuberculosis; 20, *a*, 30; +; very nervous; headache; bone disease (tuberculous?); "rheumatism"; Wassermann + + + +; cured (?) by treatment; 21, husband of 20; Wassermann negative; 22, aged 11; interstitial keratitis; deaf; Wassermann + + + +; "cured" (?) by treatment.

It is unlikely that I would have thought of hereditary syphilis in connection with this patient had it not been that her only daughter (No. 22), a large, well developed girl of 13, had been a patient of mine with interstitial keratitis and an eighth nerve involvement. This daughter and her mother had four plus Wassermanns, but the father (No. 21) gave a negative test.

The response to treatment confirmed the diagnosis. The patient received a number of injections of salvarsan and for several months took mercuric inunctions. The improvement was so prompt and so marked that she could not understand it. From a high strung woman on the verge of tears she has developed into a perfectly calm self-contained individual entirely free from any suggestion of "nerves."

Six months after the first salvarsan she said that she had not lost one night's sleep since the treatment. A month later, she stated that she was in better health than she ever had been before in her life, and what seemed most surprising was the fact that, notwithstanding several weeks of almost constant rain, she had had absolutely no rheumatism. This past winter, though she has worked in a little grocery store with scarcely any heat, she has had no recurrence of her pains.

This family illustrates in the first place how deceptive an incomplete family history may be. On the surface it appeared to contain only an unusually large number of cases of tuberculosis; but a complete study reveals certain symptoms that tuberculosis would not explain. It also illustrates the truth of Fournier's contention that hereditary syphilis presupposes to tuberculosis. But most important of all, it illustrates that the study of a child may shed some light on the ill health of a parent.

It is not known through how many generations syphilis can be transmitted. The activity of the process in the daughter with interstitial keratitis, the offspring of a heredosyphilitic mother, was manifestly such an active infection, that there seems little doubt that she could have given birth to syphilitic children. Had the child been a boy it is perhaps possible that he could have passed on the disease to another generation from infection by means of his semen.

During the past year three children have come under my observation because of a marked nasal catarrh. The discharge was thick and purulent, though not of offensive odor. The Wassermann was strongly positive in two. The third, the son of a syphilitic, was not tested, but he was put on inunctions of mercury with immediate and marked improvement. An equally satisfactory result was obtained in one of the other cases. The third child did not receive treatment. The following case is illustrative of what may result when such a condition is unrecognized:

CASE 5.—An unmarried girl of 18 (No. 35, Chart 5), was referred to me three years ago by a nose and throat specialist who suspected she might have a syphilitic process of the interior of the nose. She was a pretty buxom girl with excellent teeth, a normal palatal arch, and presenting absolutely no signs of hereditary syphilis. There was a purulent foul smelling discharge from the nose, which was increased in width at its base. She gave a strongly positive Wassermann. The doctor who referred her to me suspected she was an immoral girl, and I concurred with him in his opinion. It was not until over a year later that I made a special study of her own early history and that of her family. When she was 8 or 10 years of age she was a mouth breather; the condition was not improved by the application of adhesive plaster on her mouth, and finally at about the age of 15, her adenoids were removed. She still continued to have a nasal discharge, and received treatment from various specialists and clinics. She was at first told it was hay-fever and that in the fall it would probably go away. The nasal discharge increased, however, and she would have crusts form in the interior of the nose.

Shortly before I saw her a physician had told her she had probably contracted a contagious disease from a drinking cup, but the nature of the disease she was entirely ignorant of. One month previously, her nose had begun to swell. Over a year later a sister of this girl, aged 23 (No. 32), came to me complaining of transient swelling of her lips (angioneurotic edema?) and nasal catarrh. She was always "catching cold in her head." Her endurance had always been poor. Although 23 years old, she did not appear to be either mentally or physically more than 18. Except that she was a slender, frail, immature girl, her physical examination would be called negative but for her teeth. She had probably had hypoplasia of all six year molars; they were extremely yellow, and the lower incisors were yellow at the tips. The Wassermann was three plus.

Several months later another sister, aged 22 (No. 33), consulted me because of sudden "cramps" in the calves of the legs (intermittent claudication?). Following an illness at the age of 12, said to have been typhoid, she had ulcers on her legs. She was exceedingly nervous, and all of her life had suffered more or less from headaches, chiefly across the forehead and invariably worse at her menstruation periods. Her Wassermann was strongly positive.

A third sister, aged 19 (No. 34), suffered from epilepsy. She, too, had been subject to severe headaches, and in childhood had suffered from severe pains in her legs, referred

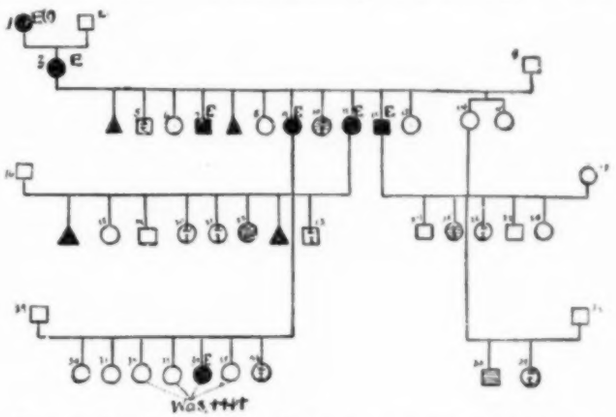

Chart 5.—Heredity chart, Family 5: 1, *d*, 84, probably epileptic; 2, *d*, 80; 3, *a*, epileptic; 4, *d*, 62, arteriosclerosis; 6, *a*, well, 60; 7, epileptic, *d*, 40, heart and kidney disease; 8, *a*, well, 50; 9, *a*, epileptic; married; 29; a drunkard and suicide; positive Wassermann reactions from their children, 32, 33, 34 and 35, and 34 is epileptic; 10, teeth at 1 week; dropsy; died at seventh year; 11, *a*, epileptic; had two miscarriages; three children died in infancy; a daughter, (22), arrested development; 12, *a*, epileptic; Wassermann reaction negative; 13, *d*, Bright's disease; aged 23; 14, *a*, said to be well; her son, 38 has a very large head and is mentally deficient; 15, *d*, 21, cause (?); 5, 20, 23, 25, 26, 36, 39 died in infancy; 24, *a*, frail, Wassermann reaction negative; 25, "blue baby"; 28, very frail.

to as "growing pains." She had always been nervous. The Wassermann test showed complete inhibition. Following the use of mercury inunctions, the nervousness was notably less.

This family, then, presented four girls, one of whom had rhinitis, three were very nervous, one was an epileptic, one gave evidence of an arrest of development both physically and mentally, and two had headaches.

As the father was a drunkard and suicide and the mother an epileptic, the so-called neuropathic heredity would explain all of the symptoms, save the nasal lesion, were it not for the positive Wassermanns. It is quite possible that the mother contracted syphilis from her husband. There is considerable, on the other hand, to suggest that the mother may have been heredosyphilitic.

One maternal aunt (No. 11) and two maternal uncles (Nos. 7 and 12) suffered from epilepsy, as well as the maternal grandmother (No. 3), who is still living at the age of 80. Her health otherwise is excellent, and she is a very active woman. Her mother (No. 1) lived to the age of 84, and is also stated to have suffered from "fits." One maternal aunt, (No. 11), and uncle, (No. 12), and the grandmother gave negative Wassermann tests.

It was not possible to make a complete study of the chil-

dren of the other members of the family. A daughter (No. 22) of one of the epileptic aunts, however, was immature in appearance and had abnormal teeth. This aunt had also had two miscarriages and lost four children in infancy or childhood. Another sister (No. 14) has one living child of 6 years who has a very large head and is mentally deficient. Another of the mother's third sisters (No. 10) had teeth at one week and died of dropsy at 7 years of age. Two sons (Nos. 7 and 13) died from kidney disease.

Care must be exercised in differentiating between what might be called incidental syphilis which merits consideration but no therapy, at least for the moment, and what we may designate as pertinent syphilis.

As an example of the former, mention might be made of a case of pneumonia recently seen in consultation. The patient, a young woman, had a large bulging forehead. Two sisters had similar foreheads. The mother was prematurely gray and very nervous. The father had a third nerve palsy. It was unnecessary to ask questions or make blood tests to diagnose familial syphilis, but this was purely incidental to her pneumonia. However, should her convalescence be protracted, the underlying hereditary syphilis might become pertinent and her improvement hastened by specific treatment.

The Wassermann test is unquestionably the most valuable laboratory test yet discovered, but to depend on it exclusively is to court disaster. There are three classes of physicians who attach undue importance to this test: first, the lazy physician who would rather some one else would make his diagnosis for him; second, the man incapable of taking a complete history and making a thorough examination, and lastly the type which Christian has so well described as the man who "with but a slight glance at his patient, and no conception of the patient's symptoms, rushes to his laboratory tests with the idea that scientific accuracy increases by the square of the distance from the bedside and by the cube of the time spent in carrying out a test."

To the dictum, "When in doubt have a Wassermann test," we should add, "but first make an intensive study of the family."

ABSTRACT OF DISCUSSION

DR. W. W. GRAVES, St. Louis: I have on several occasions called attention to the importance of studying the whole family where one of its members gives even the slightest indication of syphilis. One of the cases reported by Dr. Stoll, in which he suspected syphilis in the third generation, was brought to him because the patient had interstitial keratitis, and he studied every member of the family and found that the parents and grandparents in that family were syphilitic. Dr. Kaskell, in discussing Dr. Drysdale's paper, stated that a recent study had shown the Wassermann reaction in 40 per cent. of the wives of paretics and tabetics was positive, whereas only a small number of the progeny of these paretics and tabetics gave positive Wassermann reactions. In our study of syphilis we are inclined to rely too much on positive and negative Wassermann or luetin reactions, whereas we should study the family, not only as far as the history of that family is concerned in all its details, but we should, as well, make comparative clinical studies of families. If there is one thing that is particularly characteristic of the progeny of syphilitic parents it is the deviation to be found in such progeny when compared with the parents. I grant that it is common to find children of syphilitic parents who compare favorably with other children of the community, but the only standard we have for the individual is how he compares with his ascendant, and those who are most accessible are the parents, and then a comparison of each child with the other. The characteristic thing of children born of syphilitic parents is that they do not compare favorably with their parents, particularly in their physical endowments and in their resistance to disease. We know how rare are Hutchinson teeth, how infrequent is interstitial keratitis, how rare is deafness without otitis, and how infrequent is the Wassermann reaction, but if we study every member of the family in a comparative clinical way we cannot fail to find gross deviations which demand explanation. The most pernicious effects of syphilis are on the parental germ plasm, from which the individual develops; hence the deviations and the vulnerability to disease of syphilitic progeny.

DR. A. L. SKOOG, Kansas City, Mo.: I recently studied an interesting case, a girl of 18, who five months ago developed a hemichorea involving the right leg, arm and face. It was progressive. Outside of that there were practically no clinical findings; the reflexes were but very little different on the right side as compared with the left. A Wassermann was made on the blood which resulted in a 4 plus positive. The spinal fluid likewise showed a 4 plus positive. There was no lymphocytosis. The globulin content was increased. This girl's father and mother died when young, the patient being the only child. I could not find positive cause of death in either parent, but suspected vascular syphilis. Two sisters on the maternal side are living in the same city and are now being treated for late syphilitic troubles after certain positive diagnosis had been made.

DR. WILLIAM RAVINE, Cincinnati: I would like to ask Dr. Graves if the scaphoid scapula can still be looked on as one of the stigmata of hereditary syphilis, or if there has been reason to change the view concerning this finding. In the work of examining juvenile delinquents I always look and note the existence or absence of the scaphoid scapula, and very often we find nothing else of value.

DR. W. W. GRAVES, St. Louis: I have never stated that the scaphoid scapula should be considered a sign, in itself, of congenital syphilis in the individual or of syphilis in his parents. There is but one way to determine its significance, and that is to study every member of the same generation for the scaphoid scapula and what I have called its correlations, plus a similar study of the parents and other ascendants. The scaphoid scapula is of great value as a clew, but as evidence of congenital syphilis it should never be used alone. Since finding the scaphoid scapula eight years ago, and later indicating its clinical significance, I have feared that the profession might use the scaphoid scapula as a pathognomic sign of congenital syphilis, whereas nothing could be further from the truth.

DR. HENRY FARNUM STOLL, Hartford, Conn: I want to add my testimony to what Dr. Graves has just said in regard to the scaphoid scapulae. As examining physician of an outdoor school of a hundred pupils, in the course of a year I see a good many children and for over a year I have been on the lookout for scaphoid scapulae. I have been fortunate in having a social worker who has made intensive studies of the families for me and I agree with Dr. Graves that when it is possible to make a complete study of the parents and grandparents, one can nearly always find symptoms or signs strongly suggestive of syphilis. Occasionally it is the only stigmata. Fournier, who years ago said that paresis and tabes were due to syphilis, also stated that the heredosyphilitics of the weakling group are especially prone to tuberculosis. When they develop this disease it is especially apt to be fatal. A Colorado physician has recently made a special study of a series of cases of tuberculosis that were doing badly and found that a high percentage showed various dystrophies. He did not deduce, however, as I think he should have, that these dystrophies were probably due to hereditary syphilis. We should commence to teach the public that syphilis is exceedingly common and that it is liable to occur in any family. We should teach them to look on syphilis as a misfortune, not as a disgrace, for there are more innocent than there are guilty sufferers. Until we promulgate this idea we shall fall short of solving the problem of syphilis.

Self-Education.—The best part of every man's education is that which he gives to himself.—Sir Walter Scott.

STUDIES ON THE EFFECTS OF ACIDS*

ARTHUR D. HIRSCHFELDER, M.D.
MINNEAPOLIS

In 1891, Franz Hofmeister,[1] the physiologic chemist of Strassburg, demonstrated that if disks of gelatin were brought into water and solutions of neutral salts, they gained less in weight in some solutions than in others. The inhibition of the swelling depended on the nature of the salt, tartrates, citrates, acetates, phosphates and sulphates, causing a greater inhibition than did chlorids, bromids and nitrates. In 1908, Martin H. Fischer[2] performed the same experiments, but added hydrochloric acid to the solutions, and in these acidulated solutions obtained results similar to the above-mentioned results of Hofmeister. Fischer performed his experiments not only with gelatin, but also with fibrin and numerous tissue colloids. He found the same conditions to apply to them all, namely, all the salts inhibited the swelling of colloids, which was brought about by immersing them in acids, and did so in about the order given by Hofmeister.

Fischer applied this experiment to the most varied phenomena that concern the transfer of water within the body, and explained absorption, swelling and edema by an increased swelling or absorption of water by the colloids of the tissues. On the other hand, he explained excretion and disappearance of edema by the giving off of water when the power of the colloids to hold it in hydration became diminished.

By merely applying the findings made by Araki,[3] that local asphyxia gives rise to local formation of acids, and the findings of Ranke and Jacques Loeb[4] that cutting off the circulation gave rise to similar acid formation in the dead or injured tissues accompanied by swelling of the latter, Fischer reasoned that all injured tissues were acid to the rest of the body, and therefore absorbed water and became edematous.

Fischer, moreover, has made use of the same experiment to explain the action of drugs which accelerate secretion, especially that of the salts with diuretic and purgative action. All these salts fall in the group that most inhibit the swelling of fibrin in acid solutions. It was to this property that he ascribed the production of their specific effects, and on the basis of this conception he has recommended their use in the treatment of nephritis, edema and even glaucoma.

His doctrines are on the one hand so revolutionary that they have challenged opposition from many sides, and on the other hand, so fascinating that any one who loves a beautiful chemical theory would be actuated by a desire to confirm them.

It was in this spirit that I proceeded to repeat the experiment of Hofmeister or Fischer to demonstrate the rôle of the purgative and diuretic salts in inhibiting the swelling of fibrin, and was able to confirm it absolutely. For example, when 20 c.c. of fortieth molecular hydrochloric acid are added to 0.25 gm. powdered fibrin in a test tube, the latter swells up to a height of about 5 cm. within a few hours. In solutions containing fortieth molecular sodium chlorid, sodium nitrate, sodium bromid, as well as the same amount of hydrochloric acid, the fibrin swells to only about half this amount, while in the mixtures containing citrate, tartrate, phosphate and sulphates the swelling was scarcely more than in distilled water.

However, when these solutions were tested with various indicators, it was found that while the mixtures of chlorids, bromids and nitrates possessed almost the acidity of the original acid and could form tropeolin OO corresponding approximately to p_H log — 2, the citrates, tartrates and phosphates were barely acid to paranitrophenol (corresponding to p_H log — 5).

Determinations of the H ions made by means of the Frary hydrogen electrode by Mr. Elmer Fegan of the chemistry department showed the acidities given in the accompanying tabulation.

ACIDITIES

Fortieth normal hydrochloric acid	9.8	× 10^{-3}
Fortieth normal potassium bromid	8.0	× 10^{-3}
Fortieth normal sodium nitrate	7.5	× 10^{-3}
Fortieth normal sodium sulphate	9.1	× 10^{-3}
Fortieth normal sodium tartrate	4.5	× 10^{-4}
Fortieth normal disodium phosphate	7.3	× 10^{-4}
Fortieth normal sodium citrate	5.0	× 10^{-4}
Water	0.4	× 10^{-7}

When, however, the tubes containing tartrates, citrates, acetates and phosphates were brought up to the same degree of acidity as those containing chlorids, nitrates and bromids, either by adding strong hydrochloric acid so as to leave the anion unchanged, or by adding the corresponding acid so as to vary the anion, the fibrin then swelled to about the same degree in all of these mixtures as it did in those containing the other neutral salts. In the case of all these acids, swelling depends chiefly on the H ion except that all the neutral salts tested inhibited swelling to approximately the same degree. The striking exception was the sulphates, for in sulphate-containing solutions the fibrin did not swell as it did in the other acids; and indeed when either sodium sulphate or sulphuric acid was added to a tartrate solution in which the fibrin had already swelled, the latter at once began to contract down to a marked degree, and within a few hours had lost about half its volume.

These findings demonstrate that Fischer's doctrines of specific actions of diuretic and purgative salts on the swelling of colloids, if true, would apply to the sulphates alone; and so far as they are applied to the action of acetates, citrates, tartrates and phosphates they must be susceptible of some other explanation. It demonstrates, moreover, that except for the sulphates, the coincidence with the Hofmeister scale of actions in Fischer's experiment depends on the H ion concentration and not on the rest of the action involved.

The action of these salts in their effects on edema is closely bound up with the theories of edema itself. It must be at once recognized that the experiments of Loeb and Fischer which deal with the swelling of parenchymatous tissues falls as has been claimed by von Monakow,[5] into a somewhat different category from that of the common edemas. The latter are merely collections of lymph in the spaces of the interstitial tissue, usually loose areolar tissue, not *in* the cells but *between* them. Even if one were to grant the cor-

* From the Department of Pharmacology, University of Minnesota.
* The expenses of this research were defrayed by a grant from the research fund granted by the regents of the university.
* Read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

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rectness of Fischer's theories, they could not necessarily apply in the same way to interstitial edema.

An excellent medium for the study of such an interstitial edema is furnished by the conjunctivitis produced by the instillation of mustard oil into the conjunctival sac in rabbits.

This lesion is characterized by a very intense edema of the subconjunctival tissue. The edema fluid is colorless, and its reaction can readily be shown by the injection of indicators. It is alkaline to paranitro-

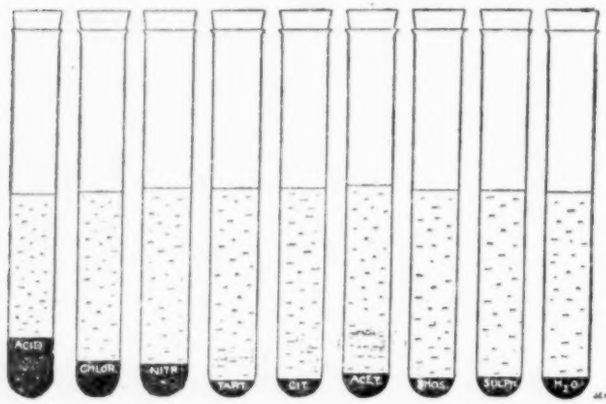

Fig. 1.—Series of test tubes containing 0.25 gm. beef fibrin plus hydrochloric acid and various sodium salts. Acid, hydrochloric acid in concentration just sufficient to turn dimethylamidoazobenzol pink (approximately, p_H log — 3). The tubes marked "chlor.," "nitr.," "tart.," "cit.," "acet.," "phos." and "sulph." contain the same amount of hydrochloric acid as the "acid" tube, but each tube contains besides this an amount equal to fortieth molecular sodium chlorid, nitrate, citrate, tartrate, acetate, phosphate and sulphate, respectively. The acidity of this series ranges from p_H log — 3 to p_H log — 6.

phenol (change at p_H log — 5), to rosalic acid (p_H log — 6) but acid to phenolphthalein (p_H log — 8), whereas, injection of phenolsulphonephthalein, which is a more delicate indicator (Levy, Rowntree and Marriott[6]) shows that its reaction lies between H log — 7.2 and log — 7.5 close to the alkalinity of venous blood. Since the blood can become less alkaline than this without edema occurring in these tissues it seems highly unlikely that this factor could be responsible for the development of edema. The reaction corresponds well with the figures obtained for transudates and for most exudates by Foa, Hanzlik, Loeb, Rowntree and Marriott, and demonstrates that the development of the subconjunctival edema can scarcely be ascribed to an acidosis.

Moreover, if the lid is excised entirely, placed in Ringer's solution, and very slightly acidulated with hydrochloric acid until it is just acid to paranitrophenol, no edema whatever develops. The same is true when mustard oil is instilled into the rabbit's eye if the lid is cut out within three or four minutes after the instillation; that is, before the edema has had time to develop. If the lid is placed in Ringer's solution, or in serum of either the same or another rabbit, it does not become edematous even though it is left there for several days. This proves that the development of the edema in this case cannot be due to simple absorption of water by the colloids of the tissue; for if this were the case the absorption should go on as well in vitro as in vivo.

Moreover, as experiments of Spiess[7] and Ninian Bruce[8] have shown, the development of edema under conditions like that pertaining in the case of mustard oil conjunctivitis is very largely dependent on the local circulatory conditions.

Spiess showed that application of local anesthetics hindered the development of edema, and Bruce demonstrated that this depended on the maintaining of the afferent nerves intact; for edema did not develop after the application of mustard oil to the conjunctiva if the trigeminal nerve had been cut and allowed to degenerate. He showed, moreover, that the inhibition of edema could not be due merely to some sensory reflex, since edema did develop if the application were made soon after the cutting of the nerve, before degeneration of the vasodilators was complete. But since no edema developed from an application of mustard oil after a sufficient length of time had elapsed to allow these vessels to degenerate, he concludes that the vasodilator nerves must remain active in order that the formation of edema may be brought about. Moreover, it can easily be shown that if epinephrin is applied to the conjunctiva immediately after the instillation of mustard oil, the development of edema may be delayed for several hours until the vasoconstrictor effect of the epinephrin wears off.

All these points taken together tend to throw doubt on the theory that edema of interstitial tissue is more dependent on the swelling of the colloids of the edematous tissues than on circulatory factors.

ABSTRACT OF DISCUSSION

DR. MARTIN H. FISCHER, Cincinnati: Franz Hofmeister never put protein into an acid medium and noted its swelling. He worked exclusively on the swelling effects of the salts of the alkali metals and alkaline earths. The discovery that acids and alkalies increase protein swelling was made by Spiro, and its detailed study was first undertaken by Wolfgang Ostwald. The antagonism between neutral salts and acids on protein swelling was discovered by me. Because of its importance for the explanation of different biologic

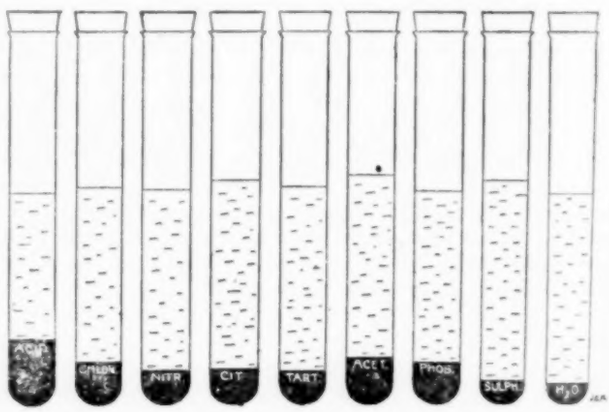

Fig. 2.—Series of test tubes with the same contents as those in Figure 1, except that enough hydrochloric acid has been added to each tube to render it just pink to dimethylamidoazobenzol (approximately the same hydrogen ion (p_H+) content as that of the "acid" tube). The fibrin in all the tubes containing salts except that in the sulphate tube has swollen to about the same dimensions as that in the chlorid and nitrate tubes or even more so.

facts, and because its discovery made possible the establishment of the analogy between the laws governing water absorption by tissues and water absorption by proteins, I have every reason for remembering where and when I discovered it. In biologic material, the effects of acid in pro-

6. Levy, R. L.; Rowntree, L. G., and Marriott, W. McKim: A Simple Method for Determining Variations in the Hydrogen Ion Concentration of the Blood, Arch. Int. Med., September, 1915, p. 389.
7. Spiess, G.: Munchen. med. Wchnschr., 1906, p. 345.
8. Bruce, A. Ninian: Arch. f. exper. Path. u. Pharmakol., 1910, lxviii, 424.

ducing tissue swelling were first noted by Otto Nasse in the sixties. It was subsequently discovered by the plant physiologists in plant tissues. It was the discovery of the antagonism between the neutral salts and acids in the swelling of proteins that furnished the last link establishing the identity of water absorption by colloids and by living tissues, and which, by explaining on a colloid-chemical basis what had previously been called osmotic, put the whole osmotic theory of water absorption by protoplasm on the defensive.

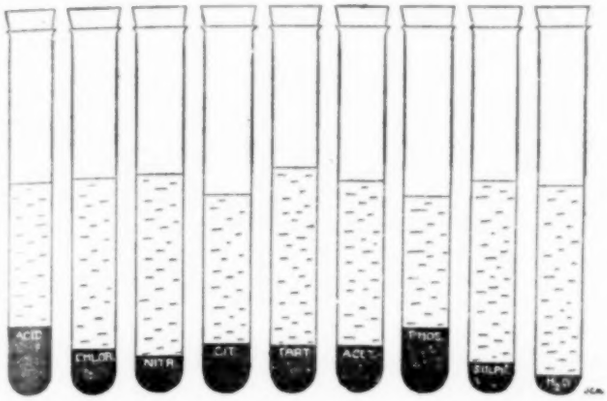

Fig. 3.—Series of test tubes with the same amount of fibrin and the same amount of salts as in Figures 1 and 2, but none with hydrogen ions brought to the concentration which just turns dimethylamidoazobenzol pink by the addition of the acid whose action corresponds in each case with that of the salt added; showing that increasing the action does not, except in the case of sulphate, prevent the swelling of the fibrin brought about by increasing the hydrogen ions.

When Dr. Hirschfelder talks of "acidity" he invariably means hydrogen ion acidity. In my writings, I constantly speak of an "increased acid content," which is something totally different and which may or may not be followed by changes in hydrogen ion acidity. It is perfectly obvious that when we add the salt of a "strong" base with a "weak" acid to any acid, we can and do neutralize the acid thereby and so reduce the hydrogen ion acidity of the mixture. My original point, that these biologic swellings do *not* follow the hydrogen ion acidity, is supported, however, by far more evidence than Dr. Hirschfelder has introduced. Protein does not swell equally, for example, in a series of different equionic acids, and he himself admits that a sulphate reduces swelling without altering the hydrogen ion acidity. Dr. Hirschfelder brings up again that old distinction in edema between the fluid in a cell and the fluid surrounding it. The swelling of the parenchymatous tissues I have defined in the terms of colloid chemistry as an increased hydration capacity of their constituent colloids. The edema fluid surrounding such a swollen cell is water of syneresis, a product like and produced similarly to the so-called "condensation" water formed in our colloid bacteriologic mediums. It is really squeezed off by the colloid mass. Dr. Hirschfelder's experiments on the production of edemas of the eyelids by the use of mustard oil are similar to those of Chiari. Against Dr. Hirschfelder's views that these swellings are not colloid in type stand Chiari's findings that such edemas are easily relieved by use of those most powerful dehydraters of proteins, calcium salts. Dr. Hirschfelder's experiments on eyelids are, moreover, subject to the same criticism which I directed against Bauer's observations on the brain—both work with tissues so stale that they have exceeded their optimum swelling point. Ringer's solution is not a substitute for blood, but a mixture of salts devised by Ringer in his experiments on excised heart muscle. The excised heart muscle suffers from lack of oxygen and therefore requires more salt from the beginning, in order to maintain its normal weight, than is required in the body. Ringer's solution, injected intravenously, is therefore found to be not a "physiologic" salt solution, but a decidedly hypertonic one. When eyelids are placed in blood serum, the experiments of Beutner are imitated. No swelling then results because no "free" water is present; it is all tied to the colloids in the blood serum.

Finally, I want to add a word regarding the importance of acid as a factor in producing edema (hydration). Were acid proved to be of no importance at all in this matter—which it will not be—it would not affect my fundamental contention that edema represents an increased hydration capacity of the tissue colloids. I have said that an abnormal production or accumulation of acids in the affected cells is one cause, but not the *only* one. While many have said that this is not true, they have not suggested any other factors that might work. I have myself added three, namely, the amins, urea and pyridin. More are destined to be discovered, and when they can be shown to be factors in increasing hydration in the case of the body, they become "causes" for edema. But a hundred such added causes do not change the fundamental fact that the colloids of the body and their state determine chiefly the amount of water held by a cell, a tissue or an organ under physiologic and pathologic circumstances.

DR. ARTHUR D. HIRSCHFELDER, Minneapolis: I hope I have not given to any one the idea that I did not desire to accord to Dr. Fischer full credit for priority and originality in the elaboration and introduction of the theory of colloid chemistry, of the imbibition of water in colloids, as a causal factor in edema and absorption. As regards the specificity of the ions which Dr. Fischer has shown, and as regards the fact that one cannot rely entirely on the hydrogen ion concentration for the production of the effect, I mention the uniformity of results in mixtures of acid with a constant hydrogen ion concentration in connection with some of the important salts which have diuretic and purgative action, namely the phosphates, the citrates and the tartrates. These contrast with Dr. Fischer's experiments. Dr. Fischer and I certainly agree entirely as regards the sulphates, and I have no desire at all to limit the conception to the idea that there were not numerous other acids whose salts, like the sulphates, inhibit swelling. As regards the factors concerned in the development of the edema in conjunctivitis from mustard oil, we can disregard as irrelevant the experiments with calcium salts, sodium codosobenzoate, etc., and confine ourselves to the consideration of the experiments I have just given. If we cut out the lid and place it at once, perfectly fresh, in rabbit's serum, it fails to swell. That is, it fails to imbibe water from the serum whether we regard that as a true solution containing suspensions or as a hydrated colloid containing about the same amount of water of hydration as the plasma or lymph. If the lid after mustard oil becomes edematous within the animal by imbibition of water from the blood or lymph it should do so when excised and immersed in serum. It seems to me, therefore, that if parenchymatous organs like brain, kidney and muscle are capable of doing this, and interstitial tissues like the conjunctival tissue are not, we should have to recognize an inherent difference between parenchymatous swelling and interstitial edema and regard the latter simply as an oversecretion of lymph.

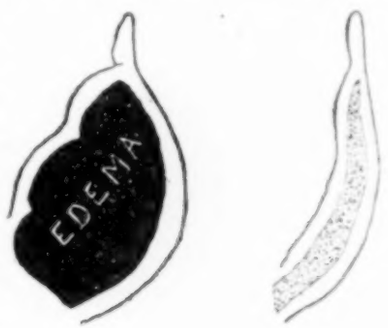

Fig. 4.—*A*, cross-section of a rabbit's eyelid excised from the rabbit one hour after the instillation of 2 drops of mustard oil into the conjunctival sac. The mustard oil was washed out with sodium chlorid four minutes after instillation. The edematous tissue is shaded black. *B*, cross-section of a rabbit's eyelid excised four minutes after the instillation of mustard oil and immersed in rabbit's serum for one hour. The dotted area represents subconjunctival tissue free from edema.

THE RESISTANCE OF ERYTHROCYTES IN NORMAL RABBITS AND GUINEA-PIGS

AND THE CHANGES PRODUCED IN EXPERIMENTAL PURPURA *

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AND
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Several times one of us has made the observation that in acute hemorrhagic dyscrasia (purpura hemorrhagica, severe anemia, etc.[1]) when purpura is present, a decrease in the resistance of the red cells to hypotonic salt solution frequently occurs. This has been quite marked at times and has led us to believe that there is a direct association between changes in the red cell resistance and the occurrence of purpura. Furthermore, as we have observed changes in the resistance only during the acute onset of purpura, or while the purpura was developing and not during subsidence of the symptoms, it has occurred to us that the decreased resistance might be a factor in the pathogenesis of the purpuric lesion. The present work was therefore undertaken in order to determine whether or not in experimental conditions simulating purpura in man such changes in the resistance of the red cells are constant.

TECHNIC

On account of the few available figures on the resistance of normal erthrocytes of rabbits and guinea-pigs, we have first endeavored to establish a standard average resistance for the erythrocytes of this species. The resistance of the red cells was tested by adding 1 drop of blood to 1 c.c. of hypotonic salt solution in strengths which were progressively increased 0.025 per cent. from 0.250 per cent. to 0.550. The results are expressed graphically in Table 1, together with the results with dogs and in man for comparison.

In our attempts to produce purpura, we first utilized agents said to be capable of producing purpuric lesions, as benzol (benzene, C_6H_6) and diphtheria toxin. The use of benzol was suggested by the work of Selling,[2] and of diphtheria toxin by that of Duke,[3] who states that he has occasionally produced purpura in animals by the use of diphtheria toxin. In a series of six rabbits, we were unable to produce purpura with benzol. The drug was given in varying doses; it produced the characteristic change in the blood picture, that is, an anemia and a leukopenia, yet in no case did evidences of purpura appear. Seven rabbits and three guinea-pigs were injected with sublethal doses of diphtheria toxin. Of these, five rabbits and all the guinea-pigs were injected daily, and all died from two to twelve days after the first injection. Two rabbits receiving only three doses of the toxin with two days intervening between each injection survived the treatment. The guinea-pigs all showed slight signs of purpura[4] when examined postmortem. In all of them were found ecchymoses in the subcutaneous tissue at the site of injection and minute petechial spots either in the perirenal fat, the omentum, the epididymis or the suprarenals. Only two of the rabbits showed at necropsy any evidence of purpura, as evidenced by occasional petechiae in the serous covering of the abdominal parietes. During life none of these animals showed changes in the number of platelets. The two surviving rabbits at no time showed any external manifestation of purpura or any noteworthy changes in the blood picture. An example of these essentially negative results may be seen in Table 2.

The failure of our efforts to produce constantly definite purpura, by the methods described, forced us to experiment with the more elaborate method described by Ledingham.[5] This is a method devised by Ledingham in connection with his confirmation of the work of the French investigators LeSourd and Pagniez,[6] which depends on the use of a so-called antiplatelet immune serum. With this serum the production of purpura experimentally is attended with no difficulty.

In the preparation of this serum the modification devised by Lee[7] was followed, as it was considered to be a more satisfactory technic than that advised by Ledingham. The latter author recommends the use of the supernatant cloudy fluid which overlies the white and red layers of centrifuged defibrinated blood. With this technic sufficient amount of platelets could not be secured to recompense for the time or the number of animals required. The technic of Lee, therefore, was followed, in which 20 c.c. of blood are drawn from the guinea-pig by inserting the needle directly into the heart. The blood is then placed immediately in a weak potassium oxalate solution (potassium oxalate, 2 gm.; sodium chlorid, 4 gm.; distilled water 500 c.c.). The blood is then centrifuged, the overlying layer of white platelets sucked off with a pipet, placed in a narrow centrifuge tube (1 cm. in width), normal salt solution added and the whole again centrifuged, in order to have as few red cells as possible in the platelet preparation. The final preparation taken up in salt solution consists essentially of platelets, though at no time was it found possible to prepare an emulsion absolutely free from red cells. The yield of platelets from the blood of two guinea-pigs was considered the amount necessary for injection into one rabbit.

Rabbits were injected with this amount four times at intervals of seven days. One week after the last

TABLE 1.—RESISTANCE OF ERYTHROCYTES OF DIFFERENT SPECIES (AVERAGE)*

	Number of Animals	Resistance	
		Complete (Maximum)	Begins (Minimum)
Rabbit	21	0.395	0.525
Guinea-pig	23	0.312	0.420
Dog	22	0.330	0.462
Man	..	0.360	0.450

* In this and succeeding tables the first column of figures under resistance indicates highest percentage of salt solution at which hemolysis was complete; the second, that at which hemolysis begins.

* From the Department of Research Medicine, University of Pennsylvania.

* Read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Musser, J. H. Jr.: Study of a Case of Aplastic Anemia, Arch. Int. Med., August, 1914, p. 275.
2. Selling, L.: Benzol as a Leukotoxin, Johns Hopkins Hosp. Monographs, 1913, New Series, 71.
3. Duke, W. W.: Pathogenesis of Purpura Hemorrhagica with Especial Reference to Part Played by Blood-Platelets, Arch. Int. Med., November, 1912, p. 445.
4. In no case were purpuric spots found in the skin, but petechiae of the serous surfaces or subcutaneous suggillations were taken as indicative of the successful production of purpura.
5. Ledingham, J. C. G.: The Experimental Production of Purpura, Lancet, London, June 13, 1914, p. 1673.
6. LeSourd and Pagniez: Compt. rend. Soc. de biol., 1908, lxiv, 931.
7. Lee, R. L., and Robertson, O. H.: The Effect of Antiplatelet Serum on Blood Platelets and the Experimental Production of Purpura Hemorrhagica, Jour. Med. Research, 1916, xxxiii, 323.

injection they were bled. In the experiments described below two different antiplatelet serums so prepared were used, Serum A and Serum B.

RESULTS

As will be seen from Table 3, by the use of this serum, purpura was produced in every guinea-pig in which it was injected. Associated with this purpura there was a very definite lowering of the resistance of the red cells. Whereas, previously, we had found in

TABLE 2.—EXAMPLE OF NEGATIVE RESULTS*

Date	Procedure	R.B.C.	W.B.C.	Plates	Resistance	
3/30	Before injection	6,600,000	10,100	626,000	0.425	0.55
3/31	0.2 c.c. toxin	.....	.....	.....	0.4	0.55
4/3	0.2 c.c. toxin	.....	.....	.....	.....	.....
4/5	0.2 c.c. toxin	.....	.....	.....	0.375	0.525
4/7	.....	6,200,000	8,400	585,000	0.375	0.525
4/17	.....	.....	.....	.....	0.375	0.55
4/24	.....	.....	.....	.....	0.375	0.525

* Rabbit 16, weight 1,200 gm., received diphtheria toxin.

normal animals that the average resistance of the cells to hypotonic salt solution was 0.42 minimal and 0.312 maximal, after the injection of the antiplatelet serum, resistance was absolutely lower, both minimal and maximum resistance being affected.

In addition to the changes noted above, the erythrocytes, leukocytes and platelets were also counted before and after injection. The following protocol is an example of our results in pigs which survived a time sufficiently long to allow hematologic examinations:

Pig 7.—A, 0.367 gm. Erythrocytes, 7,700,000; leukocytes, 8,200; platelets, 424,000; 0.5 c.c. Serum B injected intraperitoneally. Twenty-four hours later, erythrocytes, 6,160,000; leukocytes, 19,800; platelets, 40,000; bleeding time, twenty-five minutes. Necropsy: Animal died at 3 p. m.; large number of purpuric spots on abdominal wall; hemorrhages into pericardial sac; hemorrhagic infarcts in lungs; small hemorrhages into stomach and intestinal walls; large hemorrhage in uterine cavity; bladder filled with claret-colored fluid which microscopically showed erythrocytes and leukocytes; spleen very dark, and blood escaped freely when organ was cut.

In some cases there was found even more marked evidences of anemia and leukocytic increase, thus substantiating Ledingham's[8] work with antiplatelet serum. The necropsy records exemplify the general findings of other workers.

As a control, normal rabbit serum was injected into four guinea-pigs. Two of the pigs received 0.5 c.c. of this serum, the third 1.0 c.c. and the fourth 0.25 c.c. In none of them occurred any essential change in the blood counts or the platelet count; the resistance was unchanged and no evidence of purpura was found at the necropsy of the two animals that were killed.

In order to determine if the antiplatelet serum employed was hemolytic, 1 drop of defibrinated blood was added to the following solutions:

Antiplatelet serum: 1.0, 0.5, 0.4, 0.3, 0.2, 0.1, 0 c.c.
Normal salt: 0.0, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 c.c.

In the plain salt solution control there was no hemolysis; in all other solutions occurred varying degrees of agglutination and hemolysis.

8. Ledingham, J. C. G., and Bedson, S. P.: Experimental Purpura, Lancet, London, Feb. 13, 1915, p. 311.

COMMENT

The preliminary portion of this paper shows that it is possible to produce purpura with diphtheria toxin, but with results which are not constant, and that with benzol the production of the experimental lesion is difficult. The best and most constant results occurred with the antiplatelet serum. The latter must be considered from two points of view: First, it is a serum that is capable of causing purpura and, secondly, it is also hemolytic. So far as the first part is concerned, we are able to confirm the work of Ledingham and Lee that a serum made by injections of platelets can constantly produce purpura. However, it is difficult to determine just how great a part the hemolytic property of the serum plays in causing the purpura. The question arises, Is the hemolytic property due to the red cells present in the platelet emulsion employed in the preparation of the serum, or is it an inherent property of antiplatelet serum common to all cytolytic immune serums? We incline to the latter view, for a specific hemolytic serum does not possess the power of causing purpura (Pearce[9] Bunting,[10] Wells[11]) or at least does so only occasionally.

We are inclined to believe, therefore, that the hemolytic factor is a characteristic of the antiplatelet element of the serum and in part at least is responsible for the production of purpura. If this is so, the suggestion naturally follows that the pathogenesis of purpura may be dependent on a substance which destroys the platelets and at the same time decreases the resistance of the erythrocytes, and thus hastens their destruction. Through the decrease of platelets thus caused would result a loss of thrombogenic substances and the characteristic prolongation of bleeding time; but the real basis of the pathogenesis of purpura

TABLE 3.—RESULTS

Guinea-pig No.	Preliminary Resistance		Dose, Serum, C.c.	Resistance After Injection		Result	Necropsy
1	0.3	0.4	0.5, A	0.3	0.475	Killed 5 days	Petechiae; hemorrhages
2	0.275	0.4	1.0, A	0.3	0.425	Died 24 hours	Petechiae; hemorrhages
3	0.3	0.425	1.0, B	.....	.....	Died 18 hours	Petechiae; infarcts; hematuria
4	0.3	0.5	0.5, B	0.375	0.55	Died 36 hours	Petechiae; infarcts; hematuria
5	0.3	0.4	0.5, A	.....	.....	Died 18 hours	Innumerable petechiae; hematuria
6	0.325	0.425	1.0, A	.....	.....	Died 18 hours	Innumerable petechiae; hematuria
7	0.3	0.425	0.5, B	0.45	0.6	Died 48 hours	Marked purpura; hemorrhages; hematuria
8	0.275	0.4	1.0, B	.....	.....	Died 12 hours	Hematuria
9	0.325	0.45	0.5, B	0.35	0.55	Recovered	No external petechiae; plates lowered markedly
10	0.3	0.425	0.5, A	0.4	0.6+	Died 36 hours	Petechiae; hematuria
11	0.3	0.4	0.25, A	0.4	0.6	Died 60 hours	Hematuria

would be the hemolytic substance which destroys the plates and weakens red cells. To reach this conclusion, however, it is essential to work with a pure antiplatelet serum. In some additional work which has been planned it is intended, therefore, to study the effect of (1) a hemolytic immune serum as contrasted with (2) that of an antiplatelet serum made from pure

9. Pearce, R. M.: Concerning the Specificity of the Somatogenic Cytotoxins, Jour. Med. Research, 1904, xii, 1.
10. Bunting, C. H.: The Effect of Lymphotoxins and Myelotoxins on the Leukocytes of the Blood and on the Blood-Forming Organs, University of Penn. Med. Bull., 1903, xvi, 200.
11. Wells, H. G.: Chemical Pathology, Philadelphia, 1907, p. 201.

platelets, and thus to determine the importance of the hemolytic factor in a pure antiplatelet serum.

CONCLUSIONS

1. Purpura has been produced experimentally by an immune serum which is lytic to both the platelets and the erythrocytes.

2. This purpura is associated with a well marked decrease in the resistance of the erythrocytes to hypotonic salt solution.

3. Whether the destruction of platelets and the decreased resistance of the red cells are due to a common factor in the serum, or to two bodies — a hemolytic element in addition to an antiplatelet element — has not been determined.

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SPHENOID SINUS

PRESENT DAY VALUE OF SURGICAL PROCEDURE *

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The recognized procedures of today of operating on the sphenoid sinus can be divided into the intranasal and extranasal. As the latter (extranasal) is never used except when other sinuses are coaffected, we will consider more particularly those operations which are performed through the nose. By this method the anterior sphenoidal wall is invariably attacked, although the ways and means are often divergent, as, for example, Schaffer[1] used a sharp curet, Spiess[2] penetrates into the sinus an electric trephine, Grünwald[3] a conchotome, Andrews[4] a curved knife, Grayson[5] a hand-burr, etc., with or without the removal of the middle turbinate; but it was not until Hajek[6] published his paper in 1904 that the operation assumed a definite form in progressive steps.

Briefly, his method is as follows: The posterior half of the middle turbinate is removed by means of the scissors and snare (Fig. 1), the posterior ethmoid cells (superior turbinate) broken down with a hook and removed piecemeal, thus baring the anterior sphenoidal wall (Figs. 2 and 3). This ostium of the anterior wall is removed in its entirety with his heavy bone forceps especially designed for this work (Fig. 4). This method, modified as occasion may demand, is one in general use at the present time.

As this is also the most radical intranasal operation on the sphenoid that we have, the modifications consist in the preservation of the middle and superior turbinate and in the size of the opening made in the anterior sphenoidal wall. We can divide the intranasal operation into the conservative and radical, the former conserving the middle turbinate and all or most of the superior turbinate with more or less enlargement of the natural ostium, and the latter sacrificing these structures with the removal of as much of the anterior sphenoidal wall as possible. In the former the nasal structures are almost undisturbed; in the latter the posterior half of the internal nares is practically exenterated.

INDICATIONS

As the conservative method may to all intents and purposes be considered but a step in the radical, one is justified in all doubtful cases in giving the patient the benefit of the doubt. Thus, when symptoms point to some disturbance in the sphenoid region which demand surgical intervention in the form of aeration and drainage, it is unquestionably poor judgment to open up the sphenoid in its entirety when the judicious enlargement of the sphenoid ostium with the Faraci forceps will suffice to bring about a cure. As a matter of fact, the positive indications for the radical operation are so few that they can be enumerated as follows:

1. In the classical form of chronic sphenoid sinusitis with typical pain, profuse discharge and occasional symptoms of retention where one has reason to believe permanent pathologic changes have taken place in the mucosa.

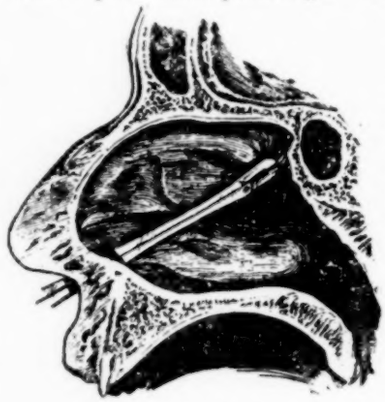

Figure 3.

2. When orbital or cerebral complications threaten or have occurred.

3. Where the conservative method has been tried and found ineffective in bringing about a cure.

4. In mucocele or pyocele of the sinus of long standing.

While these may represent the classical indications, nevertheless there is one factor that must invariably be reckoned with which will greatly influence our form of procedure, i. e., the anatomic configuration of the posterior ethmoid and sphenoidal regions. It will be remembered that the anterior sphenoidal wall is composed of two portions, the nasal and ethmoidal (Fig. 5). The nasal or free portion represents that part lying free in the nose between the septum and the superior turbinate and contains the spheno-ethmoidal recess (Fig. 6). The ethmoid portion lies behind the last of the posterior ethmoidal cells, representing a ratio of about 3 to 5, the nasal portion being the smaller. This ratio is subject to great variation, the nasal or free portion often presenting but a mere slit, particularly after inflammatory changes have taken place. Given, then, that such circumstances obtained, it would practically be impossible to perform the conservative operation (simple enlargement of the ostium) even though it was clearly indicated by the symptoms present. On the other hand, with an excessively wide pars nasalis, the middle turbinate being inrolled against the lateral nasal wall, thus bringing the anterior sphenoidal wall into clear view by anterior rhinoscopy, an extensive operation on the sphenoid can readily be made without in any way

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* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* Because of lack of space, this article is abbreviated in The Journal. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

* This paper and those by Drs. G. E. Shambaugh and Samuel Iglauer which follow are part of a symposium on sinus diseases. Of the remaining papers, those by Drs. Joseph C. Beck, Lee M. Hurd and George F. Cott were published in The Journal for December 16; those by Drs. William E. Sauer and Hanau W. Loeb and the discussion will appear in The Journal for December 30.

1. Schaffer: Ueber acute und chronische Erkrankungen der Keilbeinhöhle, Deutsch. med. Wchnschr., 1892, p. 1062.

2. Spiess: Zur Chirurgie der Sinus sphenoidalis, Arch. f. Laryng., 1897, vii, 145.

3. Grunwald: Die Lehre der Naseneiterungen, 1896.

4. Andrews knives, Muller's Instrument Catalogue.

5. Grayson: The Exploratory Opening of the Sphenoid Sinus, Laryngoscope, 1915, p. 65.

6. Hajek: Zur Diagnose und intranasalen chirurgischen Behandlung der Eiterungen der Keilbeinhöhle, Arch. f. Laryng., 1904, xvi, 105.

injuring the middle or superior turbinate, not to mention the posterior ethmoid cells.

It will thus be seen that the disposition of the structures lying in front of the anterior sphenoidal wall will guide us largely as to the form of operation that will be necessary. A sufficient portion of these structures must either be removed or pressed to one side to enable one to have free access, both visual and workable, to the anterior wall.

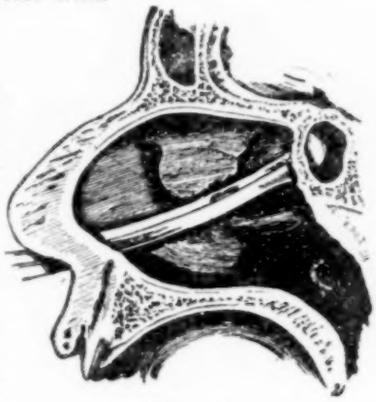

Figure 4.

VALUE OF PRESENT DAY METHODS

Before discussing the methods now at our disposal, we must consider the various forms that one is liable to meet in diseased conditions of the sphenoid.

Acute Inflammation.—I doubt if one is ever called on to treat acute sphenoiditis per se, that is, without the rest of the nasal mucosa being involved. It is, of course, possible for general acute infection of the schneiderian membrane to undergo resolution, leaving a focus of inflammation in the sphenoid sinus; but under these circumstances the disease is more or less subacute. The nearest we come to a genuine acute purulent sphenoidal empyema is the acute exacerbation of a chronic sinusitis, particularly when stagnation of the secretion occurs. As this takes on the characteristics of a pyocele, it will be dealt with later.

Catarrhal Inflammations.—This condition is one of the commonest and least recognized of all the diseases which involve the accessory sinuses. Here few of the classical symptoms are observed; but rather the persistent pharyngitis sicca, postnasal discharge, fullness and dryness in the nasopharynx, hawking and rasping in the morning, point to a diseased condition in the posterior part of the nose. Casselberry[7] has well described this form of affection. Rarely does it become frankly purulent or show marked exacerbations, but tends to continue in about the same degree of inflammation. Simple enlargement of the natural ostium in order to further aeration and drainage will usually suffice to bring about a complete cure. Irrigation is unnecessary, as the mucosa is but slightly affected and will throw off the infection when aided by ventilation. The value of the conservative operation in this form of disease is unquestioned, and should deserve wider appreciation than it now receives.

Chronic Purulent Inflammation.—In this form the mucosa is infected in local areas, some portions being more or less healthy. The characteristics of this type are remittent. Exacerbations occur in which the symptoms become pronounced, the discharge is profuse, typical headaches appear, etc. During the quiescent stage the symptoms abate, but there is always a certain amount of postnasal discharge, dull headache and a marked tendency to "catch cold." In fact, the patient must always exercise the greatest care against excesses of every sort, particularly eating heavy food at night, alcohol, tobacco and mental stress or strain.

The conservative operation here also offers great possibilities. The installation of a good sized opening in the anterior wall without disturbing the middle or superior turbinate will often furnish the desired result. The Faraci bone cutting forceps (Fig. 7) are ideal for this purpose. After the ostium is found by means of the probe and long Killian speculum, it is a simple matter to insert the end of this slender instrument and bite away as much of the anterior wall as desired, at least enough to warrant thorough ventilation and the best of drainage (Fig. 8). Of course, if anatomic formations prevent the carrying out of this procedure, removal of the impeding structures to such an extent that this purpose may be accomplished is necessary and naturally indicated. Even if this is carried out during an acute exacerbation, its value is at once manifest, for the symptoms promptly subside without further treatment and gradually become less and less apparent, until they disappear entirely, together with the patient's susceptibility to take cold or to the excesses which previously had been denied him.

Chronic Purulent Inflammation with Permanent Pathologic Changes in the Mucosa and Underlying Bone.—This is the typical sphenoidal empyema of the textbooks, and one which is much more seldom met with than either of the two preceding. It is, of course, but an advanced type of these; but when it once occurs, the symptoms admit of no doubt as to the condition present. All the classical symptoms appear and are marked. The radical intranasal operation was devised to meet this condition. As the posterior ethmoid cells are usually involved, their removal serves as a double purpose, to take away the infected cells as well as to gain room in order to open the sinus in its widest extent. The rationale of this method is to eradicate as far as possible all diseased tissue with complete ventilation of the operated area.

Mucocele.—Pent in collections of mucoid material within the sphenoid sinus are more or less rare, although they have been reported by Rhese,[8] Benjamins[9] and others. Obviously here the radical operation is indicated, as the mucosa has been converted into the lining membrane of the sac and will probably never return to its original form. It is, moreover, a well known fact that unless a large portion of the wall is resected, the mucocele tends to reform; at any rate, the sac wall continues to secrete for months. Mucoceles in themselves are rarely dangerous except from pressure, as they tend to assume enormous proportions, causing the osseous walls of the sinus to fairly melt away under their slow but steady pressure. The radical operation will at least put a stop to its subsequent growth and rob it of its dangers, although it is doubtful if the parts ever again assume their normal condition. A catarrhal discharge usually follows, and continues in greater or lesser intensity ad infinitum.

Figure 5.

Pyocele. Closed Empyema.—A collection of pent up pus in a sinus results either from the drainage pas-

7. Casselberry: Attenuated Types of Suppurative Sphenoiditis in Relation to So-Called Postnasal Catarrh, etc., Jour. Ophth. and Oto-Laryng., 1913, p. 210.

8. Rhese: Ueber Keilbeinhöhlenmukozele, Ztschr. f. Ohrenh., 1911-1912, lxiv, 169.

9. Benjamins: Mucocele des Sinus sphenoidalis, Arch. f. Laryngol., 1911, xxiv, 353.

sages becoming suddenly closed during an attack of empyema or from a mucocele becoming infected (rare). In either case it is necessary to perform a radical operation as soon as possible after the diagnosis is made. Its value in this particular incident will largely be determined by the severity of the infection and the length of time which has elapsed between the onset of the symptoms and the surgical intervention. The earlier the intervention the greater the possibilities of success. However, no case can be considered hopeless unless some grave complication, such as purulent meningitis, cavernous sinus thrombosis or brain abscess, supervenes.

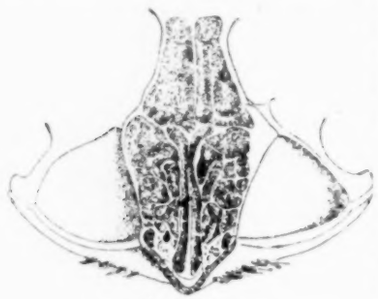

Figure 6.

INDIVIDUAL METHODS AND THEIR VALUES

Means Employed to Primarily Open the Sphenoid.—The Curet: This instrument, first utilized by Schaffer,[1] is the method now in use by Killian,[10] Hinkel,[11] Mosher,[12] Coakley,[13] Curtis[14] and many others, and usually involves a very simple technic. After the anterior wall of the sphenoid is brought into view (either by removing a portion of the middle turbinate or in favorable cases by merely infracting that structure against the lateral wall of the nose), the ostium of the sphenoid is sought or, failing to find it, the anterior wall is broken in at its thinnest part or the point of least resistance to the instrument. This is always in the neighborhood of the ostium and high up on the wall. After an opening has been installed and the proper orientation obtained by means of the probe, the break is enlarged by suitable forceps to the desired size. Killian and Mosher vary this by preserving the middle turbinate and excavating, so to speak, the anterior and posterior ethmoid cells until the anterior sphenoidal wall is reached. It is then opened by pressing it in with the beak of the instrument. The comparison of value of these methods depends on the anatomic configuration of the particular case at hand. If the middle turbinate is rolled in close to the lateral nasal wall, thereby presenting a large nasal portion of the anterior wall of the sphenoid so that the ostium is more or less convenient to the end of the probe, there is no question that the direct method or that one which leaves the ethmoid cells intact is the one to be preferred. Even if the ostium is found without being under direct control of the eye, it is perhaps better to attempt to open it, using the probe as a guide, for once being opened it is comparatively easy to enlarge the break until a portion of it is plainly visible. The nasopharyngoscope may be of great value in determining the precise location of the ostium. The great advantage of this method is that the ostium is used as a landmark, i. e., a point of entrance.

In the indirect method (through the ethmoid cells), the middle turbinate is used as a guide until the posterior cells are encountered. It has the advantage that it strikes the thinnest portion of the front wall of the sphenoid (pars ethmoiditis) and permits a much larger opening than the previous method through the spheno-ethmoidal fissure. It is of particular value where the posterior portion of the nasal septum is deflected toward the diseased side or where the middle turbinate is crowded against the septum. Its chief disadvantages are that the sphenoid ostium cannot be well utilized as a point of orientation and that even in skilled hands it is not entirely without danger,[15] certainly much more so than the inside method.

The Sharp Hook: This instrument originated with Hajek,[16] and has found many advocates (Tilley,[17] Onodi,[18] Logan Turner, Boenninghaus[19] and others). The instrument, being long and slender, permits its introduction through a very narrow olfactory fissure until the sphenoid wall is reached. A few well directed scrapes open up the sinus. This instrument is of great value, particularly where judiciously applied, as it is always working away from the points of danger. The only possibility is a sudden breaking in with injury to the lateral sinus wall and the dangerous or even fatal hemorrhage that will surely follow.[20] On this account the instrument should not be used blindly, but the ostium sought for and the wall opened in its immediate neighborhood. If, however, the ostium has been found, the need for the hook is at once superseded by the much safer curet. The one eventuality where the hook has served me to good purpose was when the landmarks had become obliterated by blood and torn tissue and where it was necessary to proceed very slowly, as much finer work can be done with its sharp point. The various cells were cautiously opened until at last the sphenoid was reached and the sinus entered through the thin plate which separates it from the posterior ethmoid cell (pars ethmoiditis). When used under these circumstances, the instrument possesses a decided value of its own.

The Curved Knife: Andrews uses this instrument, which to all intents and purposes is a sharp hook with rounded end and is manipulated as is the Hajek hook.

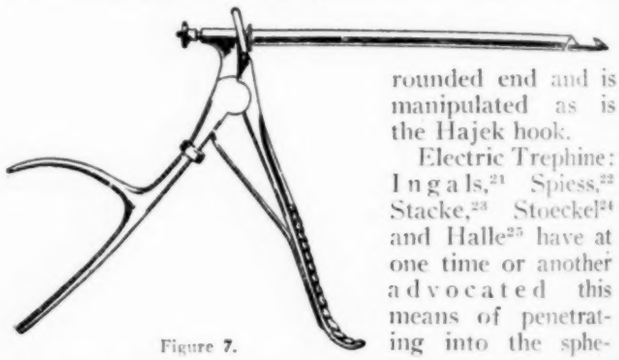

Figure 7.

Electric Trephine: Ingals,[21] Spiess,[22] Stacke,[23] Stoeckel[24] and Halle[25] have at one time or another advocated this means of penetrating into the sphe-

10. Killian: Ueber die Therapie der Entzündungen der Siebleinzellen und der Keilbeinhöhle, Verhandl. d. deutsch. otol. Gesellsch., 1900.
11. Hinkel: Symptoms and Treatment of Sphenoidal Sinusitis, Tr. Am. Laryngol. Assn., 1902, p. 93.
12. Mosher: The Applied Anatomy and the Intranasal Surgery of the Ethmoidal Labyrinth, Tr. Am. Laryngol. Assn., 1912, p. 25.
13. Coakley: Diseases of the Nose and Throat.
14. Curtis: Modern Methods of Accessory Sinus Treatment, Laryngoscope, May, 1905.
15. Mosher: Personal communication (not, however, in Mosher's hands).
16. Hajek: Nebenhöhlen der Nase, 1898.
17. Tilley: The Symptoms, Diagnosis and Treatment of Chronic Suppuration in the Sphenoid Sinus, Brit. Med. Jour., 1905, ii, 1198.
18. Onodi and Rosenberg: Die Behandlung der Krankheiten der Nase, 1906, p. 356.
19. Boenninghaus: Handbuch der speziellen Chirurgie des Ohres, 1913, iii, 209.
20. Emerson: Report of a Fatal Operative Case, Showing Developmental Absence of the Outer Sphenoidal Wall and in Its Place a Large Vein Communicating Directly with the Cavernous Sinus, Laryngoscope, 1909, p. 43.
21. Ingals: Discussion, Tr. Am. Laryngol. Assn., 1905, p. 91.
22. Spiess: Zur Chirurgie des Sinus sphenoidalis, Arch. f. Laryngol., 1897, vii, 145.
23. Stacke: Ueber die Verwendbarkeit des Elektromotors bei Operationen, Arch. f. Ohrenh., 1897.
24. Stoeckel: Die Breite endo-nasale Eröffnung der Keilbeinhöhle mit der Fraise, Arch. f. Laryngol., 1905, xvii, 496.
25. Halle: Die Intranasalen Operationen bei eitrigen Erkrankungen der Nebenhöhlen der Nase, Arch. f. Laryngol., 1914, p. 105.

noid. At first glance this would seem to be an ideal method; but taking all things into consideration, it had best be left in the hands of the few that have become skilled in its use. Ingals and Spiess penetrated the middle turbinate, but I presume that they have now abandoned this route. Halle has perhaps perfected the method to the highest state of efficiency, having previously made a crossed incision through the mucoperiosteum of the anterior wall and resected back the four flaps, thus exposing the bare wall to his burr. The main disadvantages would seem to be the manual control of the instrument, for even with the steadiest hands a slip is liable to occur, and it only means a very little slip with a rapidly revolving cutting instrument to cause serious or even fatal injuries.

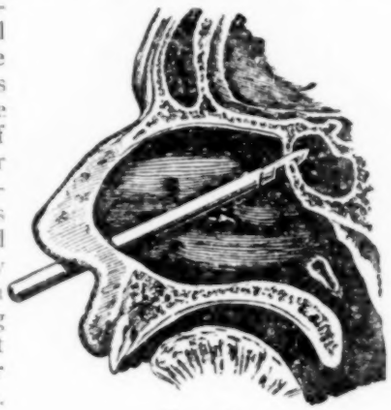

Figure 8.

The Chisel: Zarnico[26] and Gmeinder[27] have constructed long thin guarded chisels to crack an opening into the sinus. I have never used these except on the cadaver, and in this way have learned their danger, at least in my own hands. The guard is about 7 mm. behind the point. If the anterior wall is somewhat thick, the edge of the instrument is often directed upward, and when it suddenly penetrates the sinus it is liable to impinge rather sharply against the superior wall. Holmes,[28] Onodi,[29] Loeb,[30] Meyer,[31] Prentiss[32] and many others have reported cases in which a dehiscence was present in this wall and often the optic nerve was lying free within, only protected by a covering of mucosa. Injury to the sheath should cause blindness on that side and at the same time become the starting point for a subsequent meningitis. This method, compared to the others, has little to recommend it.

Eyulsor: The object of this instrument was to penetrate the ostium, then by springing the blades apart to enlarge the opening from within outward, thus working away from the dangerous structures, at the same time bringing the fragments of bone and mucosa into the general nasal cavity[33] (Figs. 9 and 10). In those cases where it is possible to lay bare the ostium it serves its purpose well. On the other hand, unless a straight passage to the anterior wall is obtained, the instrument is too thick to accommodate itself to the narrow or crooked route presented. On the whole it is more valuable in the radical method where a large passage is assured with the ostium in plain view.

The Forceps: Luc[34] used his ethmoid crushing forceps in order to reach and open the sphenoid, but Faraci[35] has constructed bone biting forceps which are ideal for the purpose. They are exceedingly thin but strong and have a lance shaped end. After the ostium is found with the probe, the lance end of the instrument is pressed in and the wall removed from behind forward. Owing to the peculiar construction of the biting end, this can be accomplished with astonishing ease and celerity, and almost as much of the wall can be removed as with the heavier types of forceps, such as Hajek's. This, I think, represents the greatest advance in operations on this structure, and is the present day method of choice in our clinic.

Hand-Burr: The idea of this instrument was conceived by Grayson[5] for the purpose of making an exploratory opening into the sinus which can also be utilized for therapeutic purposes. The perforation is made as close as possible to the angle of junction of its floor with its internal wall (Fig. 11) and is 2 mm. in diameter, a size claimed to be quite sufficient to permit the escape of any fluid from within the sinus or the introduction of the jaw of a biting forceps for the purpose of enlarging the breach. He contends that the opening is perfectly situated for drainage and one through which the cavity can be thoroughly cleansed, and also advocates beginning the radical operation at this point. The value of this procedure can be judged by comparing its advantages and disadvantages, both practical and theoretical.

Advantages.—Anatomic: All things being considered, it attacks that portion of the sinus wall most available to instrumentation. It is easy to accomplish as far as the actual manipulations are concerned. Its only danger is the possibility of wounding the sphenoid artery. It can be applied when the anterior face of the sinus is difficult of access.

Disadvantages.—Anatomic: The thickness of the sinus wall as well as the hypertrophy of the diseased lining mucosa may prevent reliable conclusions from being drawn as to the pathologic state of the interior. Logan Turner has shown that even after an extensive breach has been made, it is difficult to judge the exact condition of the mucosa without a bacteriologic examination, as disease can be present without immediate manifestations after the sinus is opened. I have substantiated this statement in a considerable number of cases. Even if the sinus contained large quantities of pus, the opening is so small that during lavage such a slight amount would be brought out at once that it would be lost in the interstices of the posterior nares before it appeared in the pus basin. Another factor: the burr is so short and dull that it enters so slowly as to easily lift up the thickened mucosa from the underlying bone, thus causing the attempts to irrigate abortive. Accepting, however, that the exploration had been successful and pus had been found, the opening is too small to permit sufficient drainage or effective treatment, which are further made more difficult by

Figure 11.

26. Zarnico: Die Krankheiten der Nase, 1910, p. 691.
27. Gmeinder: Instrument Catalogue of H. Pfau, Berlin.
28. Holmes: The Sphenoidal Cavity and Its Relation to the Eye, Arch. Ophth., 1896, xxv, 460.
29. Onodi: Das Verhältnis der Nervus optikus zu der Keilbeinhöhle, etc., Arch. f. Laryngol., 1903, xiv, 360.
30. Loeb: A Study of the Anatomic Relations of the Optic Nerve to the Accessory Sinuses, Ann. Otol., June, 1909.
31. Meyer: Sinister Unrecorded Anomalies of the Sphenoid, Ann. Otol., June, 1915, p. 257.
32. Prentiss: Some Variations in Sphenoid Sinus, Jour. Iowa State Med. Soc., 1915, p. 263.
33. Skillern, R. H.: The Present Status of the Radical Operation for Empyema of the Sphenoid Sinus, THE JOURNAL A. M. A., Dec. 19, 1908, p. 2108.
34. Luc: Leçons sur les suppurations de l'oreille, 1910, p. 369.
35. Faraci: Ferguson's Instrument Catalogue, Philadelphia.

the tendency of the wound to close, which it does, as Grayson admits, in twenty-four hours.

As a starting point for the radical operation, such a small opening (2 mm.) particularly when the bone is thick, as it is so prone to be in this particular locality, offers but a poor hold for any sphenoid forceps except possibly the Faraci, which one would hesitate to use on account of the grave risk of breaking the point off in the sinus.

Local or General Anesthesia.—In all intranasal operations on the sphenoid sinus (except in children), local anesthesia is far preferable, for it is a great advantage to have the cooperation of the patient. The pain is practically nil, the one unpleasant feature being the crunching and crackling of bone so deep within the nose. Only in those cases in which the patient is extremely nervous or the disease has so far progressed that he is semimoribund is general anesthesia indicated. In these cases a rapid and thorough operation is required in order that the patient can be returned to bed as quickly as possible with the least possible shock.

POSSIBLE ACCIDENTS DURING OPERATION

Hemorrhage.—Under ordinary circumstances the bleeding met with during and after the operation is trivial, provided one does not go down too deep into the sinus floor. The source of dangerous hemorrhages while opening the sinus is the sphenoidal branch of the nasopalatine which traverses its floor. After the sinus is opened, the cavernous sinus lying laterally is to be avoided, as two cases of accidental injury to these veins during curettement have been reported. One was fortunately controlled by tampons, but the other resulted fatally.[36]

Rhinorrhea Cerebrospinalis.—The escape of cerebrospinal fluid has also been encountered[36] in these cases; the gradual discharge continued for about twenty-four hours, and then ceased without apparently producing any untoward symptoms.

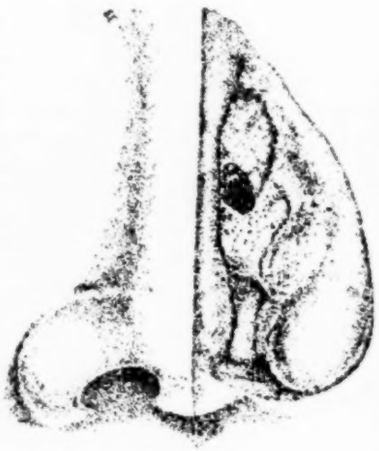

Figure 12.

During Irrigation.—After the sinus has been thoroughly opened, it is unwise to irrigate except under slight pressure, as symptoms of cerebral irritation (vomiting and unconsciousness) have followed its use.[37]

Applications of Strong Antiseptics to the Sinus Mucosa.—It is unwise to apply any irritating solutions directly after an operation, as the already inflamed mucosa shows a great tendency to postoperative swelling. Silver nitrate in particular will often cause an exacerbation of the symptoms and retard resolution.

Packing Tightly With Gauze.—If one wishes to provoke alarming symptoms, this procedure will certainly accomplish the result. Hajek[38] long ago called attention to it, and I can substantiate his experiences. All the signs of beginning cerebral involvement appear and continue until the packing is removed, and indeed not infrequently for some days thereafter. The irritation to the mucosa produces a swelling which cannot be taken up by the tight gauze packing; consequently there results great pressure within the sinus.

36. Glas: Rhinorrhoea Cerebro-Spinalis, Wien. Laryng. Gesellsch., Centralbl. f. Laryngol., 1904, p. 154. Decherd, H. B.: Personal communication.
37. Curtis: The Sphenoidal Sinus (Case), Laryngoscope, 1904, p. 866.
38. Hajek: Fall von Empyem der Keilbeinhöhle mit bedrohlichen Stauungserscheinungen, Wien. med. Wchnschr., 1895, Nos. 32, 33.

AFTER-TREATMENT

Subsequent treatment is as a rule simple. The one object is to provide sufficient drainage and aeration to the diseased mucosa. Directly following the operation it may swell up into a thick edematous cushion which nearly fills the sinus, due to postoperative reaction. On inspection actual polypoid hypertrophies may be present. One is tempted to use the curet at this stage, but it is interdicted. The swelling usually subsides in a few days under proper drainage, and I have seen actual polyps disappear spontaneously. If after a week or ten days necrotic spots still persist, the curet may be gently used (only on the floor and septum) to remove them.[6]

As the opening shows a great tendency to close through granulation tissue springing up, the edges should occasionally be touched with a bead of silver nitrate. Postoperative hemorrhage has been known to occur as late as the fifteenth day;[39] five cases also have been reported as occurring on the seventh to tenth,[40] one of which[39] required ligation of the external carotid.

As far as tampons are concerned they had best be entirely omitted. The sinus will drain better without them and it is now the consensus of opinion that to promote healing they are without value and may even exert deleterious influences. Only for the purpose of controlling hemorrhage should they be placed in the sphenoid sinus. Even though there is not much pain, it is well to administer[41] an opiate in the evening to insure a good night's rest.

IMMEDIATE AND ULTIMATE RESULTS

Conservative Method.—In those cases in which the mucosa only requires aeration and better drainage in order to throw off the inflammatory process, the simple enlargement of the ostium without injury to the adjoining structures will give brilliant results. The relief to the patient is almost immediate with practically no discomfort in the form of pain or hemorrhage. After the slight postoperative swelling subsides, the nose looks, and is to all intents and purposes, perfectly normal. It is true that the enlarged ostium rapidly contracts until it assumes its original size, but in the meantime the patient has become cured.

Radical Method.—It is often marvelous, the effect on the symptoms which this operation produces even in the severest cases. The excruciating pain is almost instantly relieved or at least so mitigated as to become bearable;[42] the patient seems at once to be transported into another atmosphere, from a desperately sick individual to one that is on the road to recovery. Meningeal symptoms[43] and cerebral manifestations[44] rapidly

39. Myles: Trephining and Curettage of the Sphenoidal Sinus: Profuse Secondary Hemorrhage Requiring Ligation of the External Carotid, Laryngoscope, 1903, p. 293.
40. Hinkel: Symptoms and Treatment of Chronic Empyema of the Sphenoidal Sinus, Laryngoscope, 1902, p. 736. Gleitsmann: Discussion, Tr. Am. Laryngol. Soc., 1895, p. 91. Hepburn: Discussion: Tr. Am. Laryngol., Rhin. and Otol. Soc., 1901, p. 68. Hajek: Nebenhohlen der Nase, 1915, p. 379. Boenninghaus: Handbuch der Speziellen Chirurgie, 1913, iii, 212.
41. Hajek: Experiences in the Endonasal Radical Operation upon the Sphenoid Cavity, Ann. Otol., March, 1909.
42. Skillern: Ein Fall von Geschlossenen Empyem, Ztschr. f. Laryngol., 1909, i, 337.
43. Solenberger: Sphenoid Disease with Brain Symptoms, Colorado Med., September, 1914.
44. Thomson, St. Clair: Cerebral and Ophthalmic Complications in Sphenoidal Sinusitis, Brit. Med. Jour., 1906, ii, 768.

begin to clear up. Kander[45] and Avellis[46] have reported cases which had gone on to meningitis cured, to which I can add two more. One patient was moribund and had been so for forty-eight hours and required practically no anesthetic at the time of operation. Four hours afterward he was demanding something to eat. The temperature curve assumes a more normal one and the patient usually goes on to uneventful recovery.

As far as the parts themselves are concerned, one would expect considerable reaction to follow such an extensive procedure (removal of middle turbinate, posterior ethmoid cells and anterior wall of sphenoid sinus), but such is usually not the case. The patients complain of little pain, although there is constant leakage of serosanguineous fluid for eighteen to twenty-four hours. The internal engorgement is marked, which usually sympathetically affects the opposite side, compelling the patient to breathe through the mouth until it becomes reduced, which usually begins to occur at the end of the second day. The swelling gradually subsides until the normal is reached, which is from the seventh to the tenth day.

Nature seems to take care of the void in the same manner as it does the tonsillar fossa after a tonsillectomy, as it becomes more or less filled with granulation tissue (Fig. 12). I might add that I have never seen a dry nose follow this operation, no matter how extensive the procedure.

Concerning the sinus itself, a large percentage recover entirely;[47] but it must be remembered that its resistance is lowered, and will become reinfected with subsequent attacks of coryza with the reformation and secretion of pus. This, however, clears up readily under appropriate treatment.

VALUE OF OPERATION

It would seem almost superfluous from what has been said to discuss this phase of the subject. While its curative value alone in sinus disease makes it invaluable to the rhinologist, the brilliant and dramatic results are those obtained when grave cerebral and orbital symptoms have supervened. Many cases of progressive blindness have been reported with recovery of vision.[48] I can substantiate these results in several incidents. Many other ocular conditions as well as symptoms remote from the seat of infection have been cured by a timely radical operation on the sphenoid.

Sitting, then, in calm judgment on the merits and demerits of the endonasal sphenoid operation, one must necessarily come to the conclusion that on account of the almost uniformly brilliant results obtained and its comparative freedom from danger, it must be classed as a procedure that no rhinologist of the present can afford not to master.

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45. Kander: Meningitis beim Keilbeinhöhlen Empyem mit Ausgang in Heilung, Verein Süddeutsch. Laryngol., 1907, p. 109.
46. Avellis: Ortliche seröse Meningitis bei akuter Keilbeineiterung, Verein Süddeutsch. Laryngol., 1907, p. 116.
47. Fraser and Verel: An Analysis of Seventy-Six Consecutive Operations on the Frontal, Maxillary, Ethmoidal and Sphenoidal Sinuses, Jour. Laryngol., 1913, p. 69.
48. Brophy: Report of Three Cases of Monocular Blindness Due to Sinus Obstruction, with Recovery of Vision, Ophth. Rec., 1915, p. 351. Stark, H. H.: Sudden Blindness Due to Suppuration of the Accessory Nasal Sinuses, THE JOURNAL A. M. A., Oct. 30, 1915, p. 1513.

Every Man's Debt to His Profession.—I hold every man a debtor to his profession from the which as men of course do seek to receive countenance and profit so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto.—Bacon.

THE SURGERY OF THE ETHMOID LABYRINTH *

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CHICAGO

The ethmoid is in several ways the central point of interest in questions relating to the nasal accessory sinuses. Developmentally the other sinuses, particularly the frontal and maxillary, are distinct outgrowths from the ethmoid. Anatomically the ethmoid, because of its central location, constitutes a key to the other nasal sinuses, including the sphenoid, as well as the frontal and maxillary sinuses. Pathologically the ethmoid labyrinth is more or less involved in almost every inflammatory process involving the other sinuses. And finally, the surgical treatment of inflammatory processes in any of the nasal accessory sinuses includes to a greater or less extent operation on the ethmoid labyrinth. It is evident, therefore, that any one who undertakes the treatment of nasal accessory sinus trouble should first of all be well grounded in the surgical anatomy of the ethmoid and should be familiar with the methods of operating on this structure.

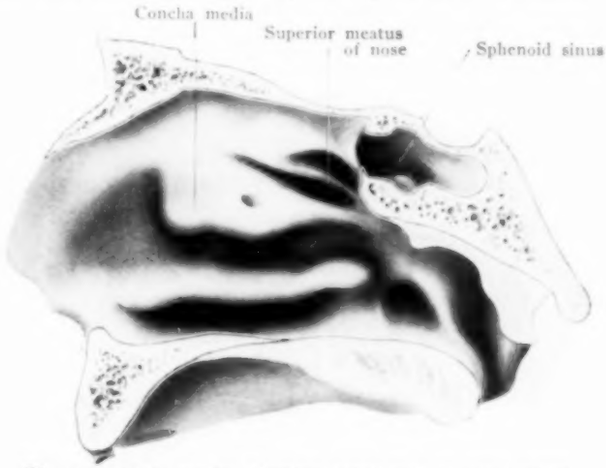

Fig. 1.—Sagittal section, showing lateral wall of nasal cavity.

Anatomic variations are peculiarly characteristic of the nasal accessory sinuses, and in none is this more marked than in the case of the ethmoid. There are, however, certain anatomic relations common to all cases. It is these constant relations which it is most important to keep in mind, since it is on these that the surgery of the labyrinth is based.

The first anatomic fact to keep in mind is the openings of the ethmoid cells into the nose. These openings are separated into two series by the plate of the concha media, and are clearly shown in Figures 1 and 2. The first figure, with the middle turbinated body in place, shows the openings for the posterior ethmoid cells above and posterior to this structure. Inspecting the nose from in front, secretion coming from the posterior ethmoid cells will be seen between the septum and the concha media, that is, in the meatus nasi communis. Figure 2, with the middle turbinated body cut from its attachment, shows the openings from the anterior series of ethmoid cells in the meatus nasi media. Secretion coming from these cells appears, therefore, between the concha media and the outer wall of the nose.

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

A second important anatomic fact is the relation of the ethmoid to the orbit. This relation is shown in Figure 10. The outer wall of the ethmoid labyrinth is formed by the orbital plate of the ethmoid and to a

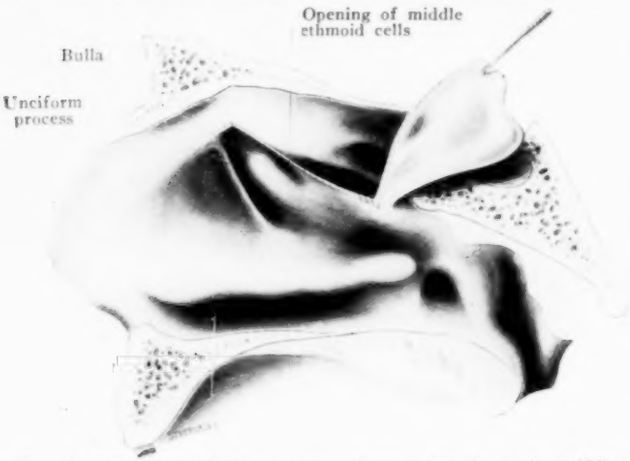

Fig. 2.—Middle turbinal removed, showing structures in middle meatus.

limited extent by the mesial wall of the maxillary sinus.

A third constant anatomic relation which has an important surgical bearing is the relation between the ethmoid cells and the brain fossa. This relation is best shown in a frontal section, as in Figure 10. The roof of the ethmoid labyrinth is formed by the floor of the anterior brain fossa. The bone forming this wall of the labyrinth is rather firm as compared with the much more fragile orbital wall. It is especially important to keep in mind the relation between the ethmoid cells and the cribriform plate. The bony plate forming the roof of the labyrinth joins the cribriform plate, but at no place do the ethmoid cells come in contact with this plate. The cribriform plate forms the roof of the meatus nasi communis. In order, therefore, to avoid perforating this delicate structure when operating on the ethmoid labyrinth, it is important to keep out of the meatus nasi communis. This

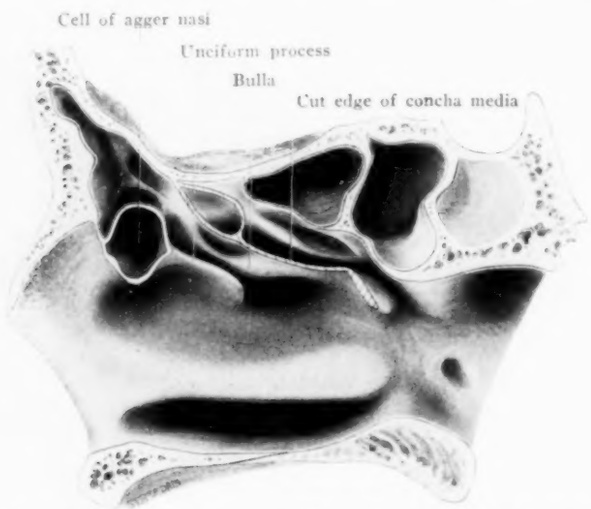

Fig. 3.—Lateral wall of nose; middle turbinal removed and ethmoid cells opened.

is best accomplished by allowing the mesial wall of the labyrinth to stand until the exenteration of the ethmoid cells has been completed, when this wall of the labyrinth can with safety be clipped away.

There are certain anatomic variations to keep in mind when working on the ethmoid labyrinth. One variation is the development of ethmoid cells outside the usual confines of the labyrinth. The first of these is the distention of the concha media by an ethmoid cell. This cell occasionally develops to a great size, obstructing the respiration on the affected side. The largest cell of this sort recorded was reported by me. The cell measured 28 mm. long and 25 mm. broad.[1]

Another anatomic variation is the development of an ethmoid cell in the unciform process, in the region which we designate as the agger nasi. This anatomic variation is not such a frequent occurrence as the cell in the concha media. Like the cell of the concha media, it occasionally takes on a large size. Cells of the agger nasi are shown in Figures 3, 5 and 7. The one shown in Figure 3 is unusually large. Other anatomic variations of this sort are the development of ethmoid cells upward into the frontal sinus, laterally over the roof of the orbit, and posteriorly over the sphenoid sinus.

Operations on the ethmoid consist of the removal of a part or the whole of the ethmoid turbinated body, the

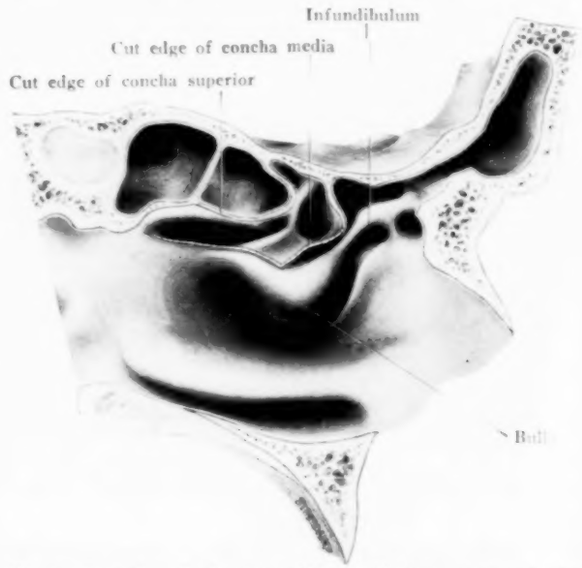

Fig. 4.—Lateral wall of nose; middle turbinal removed and ethmoid cells opened; bulla ethmoidalis large and dependent.

concha media, and the exenteration of a part or the whole of the ethmoid labyrinth. Only the intranasal operation on the ethmoid will be considered here, for the reason that the external operation on the ethmoid is rarely called for.

The operations on the concha media are undertaken for several quite different conditions. Some have to do with pathologic conditions outside the ethmoid, as disease in the frontal and maxillary sinuses. Others are concerned with disease of the ethmoid itself.

The resection of the concha media, by which the middle meatus is laid open, is often the simplest way to get relief from obstruction causing retention in the frontal or maxillary sinuses. The removal of the concha media is also the preliminary step in the resection of that part of the nasal wall of the maxillary sinus lying in the middle meatus. This is the simplest of all the operations on the maxillary sinus, and is often the operation of choice for the relief of acute or chronic empyema of this sinus. The resection of the

1. Shambaugh, G. E.: Bony Cysts of the Middle Turbinated Body, Ann. Surg., 1902.

concha media is also the preliminary step in securing adequate drainage for acute or chronic empyema of the frontal sinus.

The conditions in the ethmoid itself, for the relief of which the resection of the concha media is undertaken, include cases in which, as the result of a narrow nasal chamber, the middle turbinated body is found wedged so tightly between the septum and the outer wall of the nose that with the slightest intranasal reaction the normal ventilation of the anterior ethmoid cells, as well as the frontal, and even the maxillary sinus, is impaired. The symptom resulting from this condition is first of all sensation of pressure or even pain between the eyes. The obstruction often excites attacks of sneezing, which are not infrequently associated with profuse watery nasal discharge. The resection of the concha media is undertaken to relieve nasal obstruction occasionally caused by a bullous enlarge-

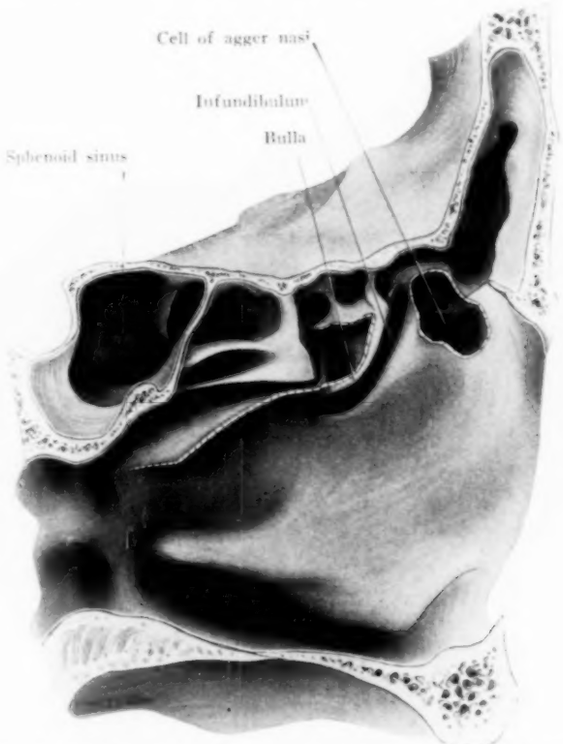

Fig. 5.—Lateral wall of nose; ethmoid cells opened. Cell in agger nasi.

ment of the concha media itself. This operation is often the first step in the operations for the relief of the symptoms resulting from the pathologic condition known as hypertrophic ethmoiditis. Very often the improved ventilation of the ethmoid labyrinth, accomplished by the resection of the concha media, is all that may be required to bring about a relief of these annoying symptoms and for the cure of the earlier stages of hypertrophic ethmoiditis. The frequency with which the condition of hypertrophic ethmoiditis is found associated with the anatomic condition described above, causing impaired ventilation of the ethmoid, justifies the suspicion that the development of hypertrophic ethmoiditis may sometimes be the result of impaired ventilation of ethmoid cells.

It is evident that the class of cases in which resection of the concha media is indicated includes very often just those cases in which, because of anatomic conditions, the operation is more difficult to carry out. In recent years I have discarded other methods of removing the concha media for the method devised by Andrews, by which, with the use of a specially made

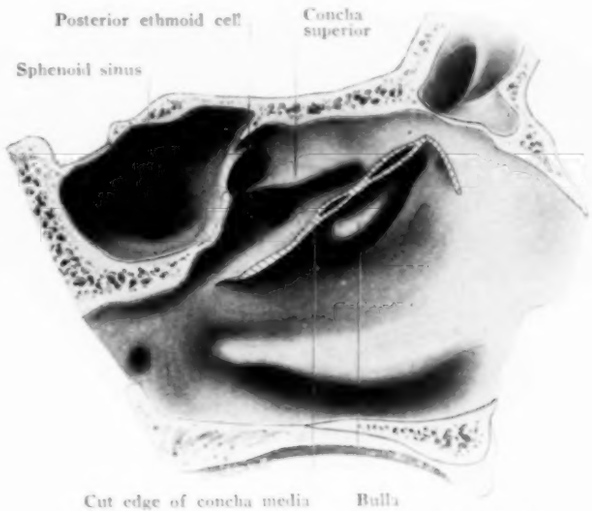

Fig. 6.—Lateral wall of nose; concha media removed.

knife, the anterior part of the concha is easily cut away from its attachment, permitting the introduction of a snare, when the turbinated body can either be cut off or pulled away from its attachment. By this method I have found it feasible to remove the middle turbinate in the most difficult cases in which, because of the constricted nasal chamber, it was scarcely possible to secure more than a glimpse of the lower edge of this structure.

The exenteration of a part of the ethmoid labyrinth is undertaken chiefly in the effort to secure better drainage for a frontal sinus infection. Here the anterior ethmoid cells are often included in the inflammatory process affecting the frontal sinus. The ethmoid

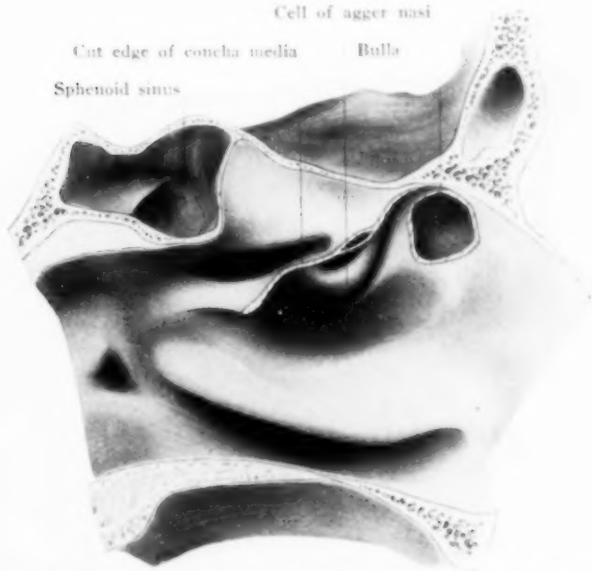

Fig. 7.—Lateral wall of nose; concha media removed. Large cell in agger nasi.

operation serves, therefore, the double purpose of removing the diseased ethmoid cells and of securing better drainage from the frontal sinus. The partial exenteration of the ethmoid cells may also be under-

taken in cases of beginning hypertrophic ethmoiditis, or for the relief of symptoms arising from the rather rare condition of mucocele of the ethmoid.

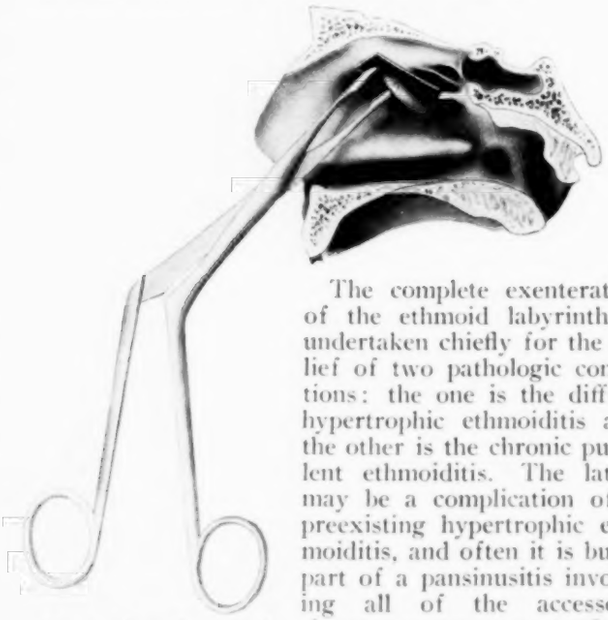

Fig. 8.—Lateral wall of nose; concha media removed. Second step in exenteration of the ethmoid labyrinth, forceps breaking into bulla ethmoidalis.

The complete exenteration of the ethmoid labyrinth is undertaken chiefly for the relief of two pathologic conditions: the one is the diffuse hypertrophic ethmoiditis and the other is the chronic purulent ethmoiditis. The latter may be a complication of a preexisting hypertrophic ethmoiditis, and often it is but a part of a pansinusitis involving all of the accessory sinuses on one or on both sides of the nose.

In selecting a method for accomplishing the ethmoid exenteration, two principles should be kept in mind: the first is the safety of the patient, the second, simplicity of technic. For obvious reasons the operation is usually done under a local anesthetic. It is quite important, therefore, that it should be done as quickly as possible. The method for exenteration of the ethmoid which I shall describe here is the one which seems to me to fill best the requirements of safety, simplicity and rapidity.

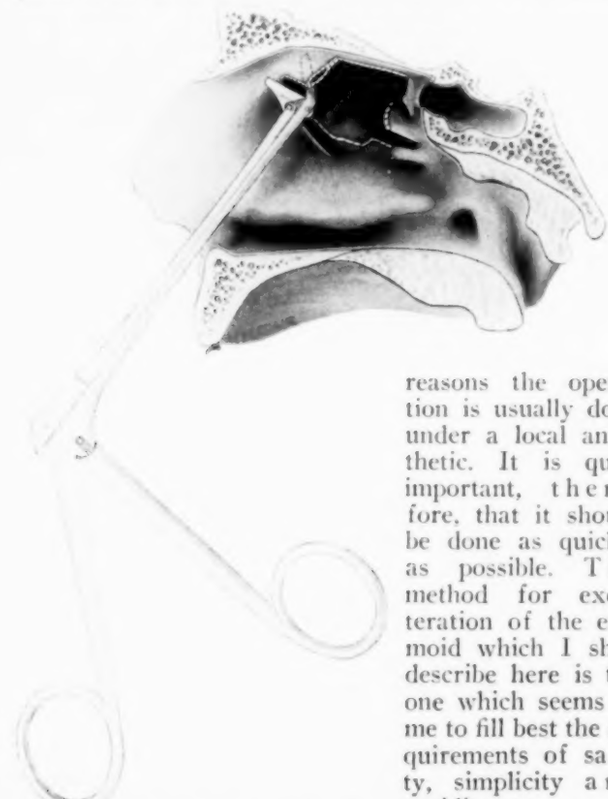

Fig. 9.—Final step in ethmoid exenteration; removal of anterior ethmoid cells.

The first step in most cases is the removal of the concha media. This is necessary to give the best possible inspection of the field of operation. In exceptional cases in which the concha media is small and does not interfere with the inspection of the structures forming the floor of the ethmoid in the middle meatus, the concha media may be left standing, at least until the exenteration of the labyrinth has been completed, when it should, as a rule, be removed, in order to prevent further impairment of drainage, especially through the formation of inflammatory adhesions.

The second step in the operation is accomplished in a very few seconds by using the type of nasal forceps shown in Fig. 8. This instrument has in my hands proved to be the one best suited for such work. It is easily held firmly with the fingers of the right hand while the cutting edges of the blades are readily forced through the fragile cell walls. The force is always directed more horizontally than upward and away from the septum, so as to avoid risk of injuring the cribriform plate. The risk of injuring the orbital plate is not great. The removal of a part of the orbital plate is apparently not any more dangerous than the exposure of the dura in the course of a mastoid operation. The most dependent part of the ethmoid labyrinth is the bulla (Figs. 10, 6, 4). This is broken into first (Fig. 8). In those exceptional cases where the agger nasi is the seat of an ethmoid cell, it will occasionally be advantageous to begin, as Mosher has advised, by breaking into this cell first. After the bulla has been broken into, it is the work of but a few seconds to complete the exenteration of the middle and posterior ethmoid cells.

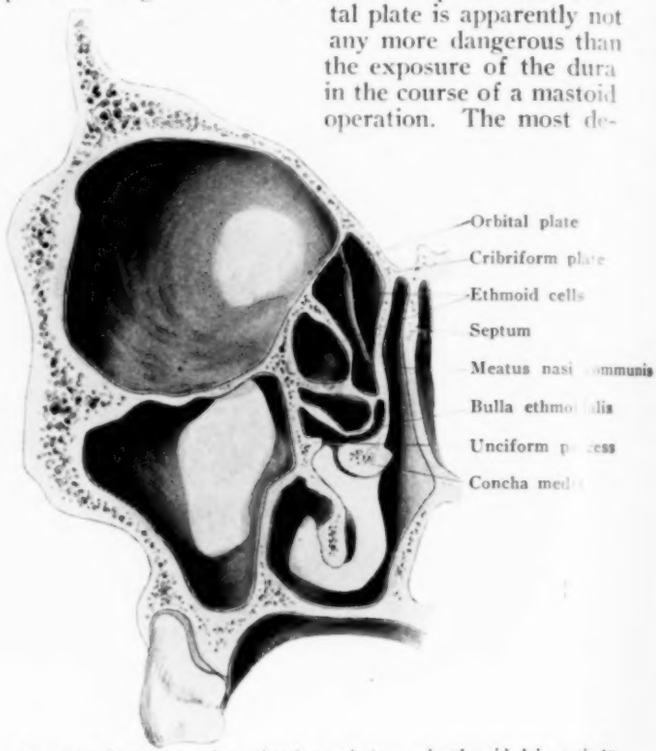

Fig. 10.—Frontal section, showing relations of ethmoid labyrinth to surrounding structures.

The final step in the operation is the removal of the anterior ethmoid cells. This is done by using forceps which cut forward (Fig. 9). The median plate of the ethmoid is best left in place until all of the cells have been removed. This serves as a protection against encroachment on the meatus nasi communis, the roof of which is formed by the cribriform plate. In some cases, especially where the nasal passage is contracted, it is best not to attempt to preserve this

median plate of the ethmoid but to cut it away as rapidly as the adjoining cells are destroyed.

The use of curets will sometimes be of distinct assistance in accomplishing the exenteration of the ethmoid cells. There are two situations where I have found the curet an assistance. The first is a condition where, because of an unusual firmness of the bony walls, it is found difficult to break into the labyrinth with the forceps. The second indication is to complete the removal of the labyrinth in certain cases, after the work with the forceps has been completed. The type of curet to use is important. This should be a strong, well made curet, without a sharp point. The type used in mastoid work, for example, the Whiting model, serves our purpose here very well. This is the type of curet which Mosher has also adopted for operation on the ethmoid. I have found the Mosher model the best curet for ethmoid work.

As regards after-treatment, most of the patients require no special treatment. The operation is done at the hospital, since the shock resulting from work on the ethmoid makes it undesirable for patients to attempt to go home immediately after the operation. Most of the cases require no tampon if the patient remains at the hospital, where directions can be left for the introduction of a tampon in case secondary bleeding requires it. Occasionally one meets with severe bleeding at the time of the operation which may require the immediate introduction of a tampon. This should always be removed not later than the following day.

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THE OBLIQUE METHOD OF ROENTGENOGRAPHY OF THE ETHMOID AND SPHENOID CELLS *

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The usual method of roentgenography of the accessory cavities of the nose consists in directing the rays through the sagittal axis of the skull and intercepting them on a photographic plate placed immediately in front of the patient's face.

The roentgenograms obtained in this manner delineate the normal and diseased frontal sinuses and antrums in an entirely satisfactory manner, but on the other hand, the sphenoid projection is of practically no value. The ethmoid labyrinth of each side is also outlined on the plate, but not so satisfactorily as the frontal sinuses and maxillary antrums. This is due to the fact that in the sagittal roentgenogram the ethmoid and sphenoid cells lie in a row vertical to the plate, and thus the outline of one cell overlaps the other, rendering it difficult to distinguish disease of the anterior from that of the posterior group of cells. However, since the posterior ethmoids project farther into the orbit than the anterior ethmoids, abnormal blurring corresponding to the position of the former group may indicate their disease.

Full profile roentgenograms (bitemporal) give important information concerning topographic anatomic relations, but since the cell outlines of one side are directly superimposed on those of the other, they are comparatively valueless for diagnostic purposes.

Roentgenograms taken in the vertical axis of the skull with the plate either under the chin or at the vertex (Scheier,[1] Pfeiffer[2]) delineate the ethmoid and sphenoid cells, but are usually too indistinct for accurate diagnosis. As Skillern[3] puts it, "the posterior ethmoid and sphenoid are not always successfully skiagraphed, but there is every reason to believe that these will also be accessible as our technic becomes more and more perfect."

The Oblique Method.—The remaining method of roentgenography of the ethmoids and sphenoids is the oblique method, introduced by Rhese[4] some years ago, but never generally adopted either here or abroad. As I shall endeavor to show in this paper, Rhese's method is the most valuable of all for the study of ethmoid and sphenoid disease, but the difficulty attendant on the reading of oblique roentgenograms has probably interfered, to some extent, with its more general adoption.

The technical objections to the method now no longer exist, as demonstrated by Dr. Charles Goosmann, who very kindly undertook the roentgenography for me, and to whom I am greatly indebted for valuable advice and cooperation. In passing I may state that at my suggestion an attempt was made to obtain roentgenograms of the ethmoids on photographic films placed within the nose, but these could not be accurately read, owing to the small field under exposure.

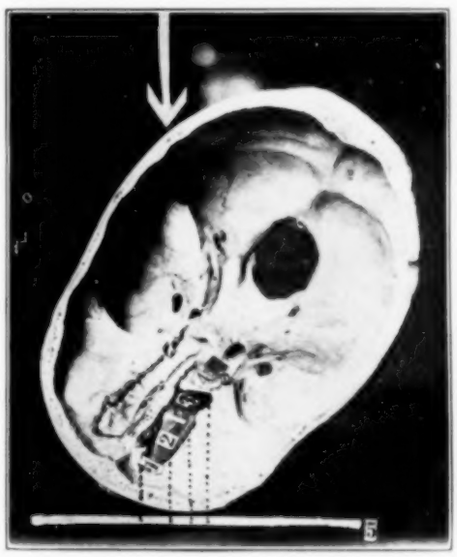

Fig. 1.—Position of skull, and direction of central rays, marked by arrow: 5, Roentgen-ray plate; 1, roof of frontal sinus; 2, of anterior ethmoids; 3, of posterior ethmoids; 4, of sphenoid. Dotted lines indicate projection onto plate.

Rhese's technic is as follows: The patient lies on his side on the table with his face in contact with the photographic plate. (The position is that of a person sleeping on his side, his arm under his head representing the plate.) The head is in contact with the plate at three points, namely, the malar eminence, the outer edge of the supra-orbital margin and the tip of the nose. The central rays go through the upper

* Read before the Section on Laryngology, Otology and Rhinology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Scheier, Max: Die Bedeutung der Roentgenstrahlen für die Erkrankungen der nasalen Nebenhohlen, Beitr. z. Anat., Physiol., Path. u. Therap. d. Ohres, d. Nase u. d. Halses, 1908, i, 402.
2. Pfeiffer, W.: Eine neue roentgenographische Darstellungsmethode der Keilbeinhohlen, Arch. f. Laryngol. u. Rhinol., 1910, xxiii, 420.
3. Skillern, R.: Accessory Sinuses of the Nose, Philadelphia, 1913.
4. Rhese: Die chronischen Entzündungen der Siebbeinzellen und der Keilbeinhöhle; mit besonderer Berücksichtigung ihrer Beziehung zur allgemeinen Medizin und ihrer Diagnostik durch das Roentgenverfahren, Arch. f. Laryngol. u. Rhinol., 1910, xxiv, 383. Sonnenkalb: Die Roentgen Diagnostik des Nasen und Ohrenarztes, Jena, 1914, p. 76.

edge of the auricle, and are thus directed obliquely through the head, but vertically on the plate (Fig. 1).

A study of Figure 1 shows the lines in which the sphenoid and ethmoids of the side nearest the plate

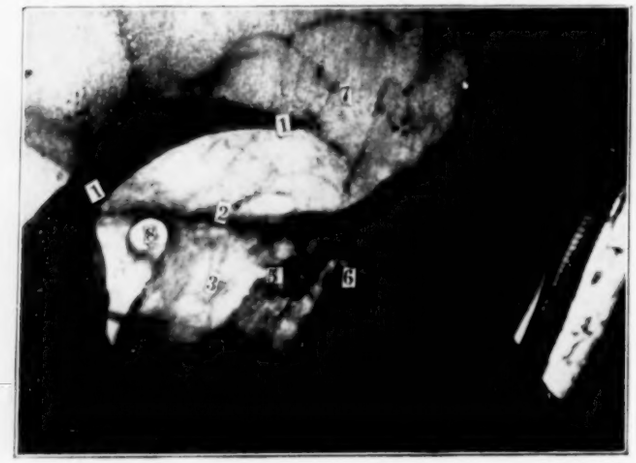

Fig. 2.—Roentgenogram of dry skull (right side): 1, 1, orbital margin; 2, suture line between frontal bone and lamina papyracea; 3, sphenoid; 5, posterior ethmoids; 6, anterior ethmoids; 7, frontal sinus; 8, optic foramen.

are projected. The posterior-superior portion of the sphenoid, *S*, on the near side, is left uncovered by the sphenoid of the far side. The posterior-ethmoid group is projected immediately anterior to the sphenoid sinus and is overlapped by the sphenoid and ethmoids of the far side. The anterior ethmoids are overlapped by the ethmoids of the far side. The upper portion of the anterior ethmoids, that is, "the fronto-ethmoids," are projected on the plate without any overlapping from the opposite side.

Since the sphenoid and the ethmoid labyrinth on the side nearest the plate are separated from the latter by

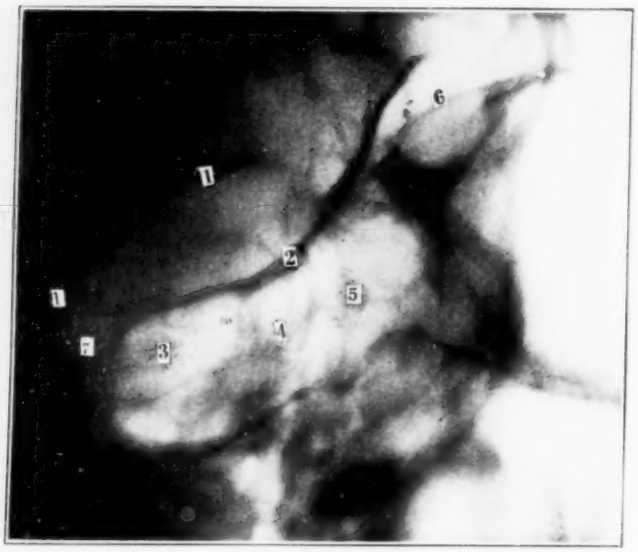

Fig. 3.—Roentgenogram of normal cavities in an adult (right side): 1, 1, orbital margin; 2, suture line; 3, sphenoid; 4, posterior ethmoids; 5, anterior ethmoids; 6, frontal sinus; 7, optic foramen.

the short distance equivalent to the depth of the orbit, they naturally come out distinct in the roentgenogram. For purposes of comparison a plate must be made of each side.

The Normal Sphenoid and Ethmoids.—In the oblique roentgenograms there are certain fairly constant lines or landmarks which aid in the reading of the plates. The margin of the orbit appears as a circle and the two orbits together give the impression of a pair of large-rimmed glasses resting on the nose. Within the circle of the orbit which was in contact with the plate a horizontal line will be noted crossing the median wall and representing the suture line between the lamina papyracea and the frontal bone. The superior fissure of the orbit is represented by a line descending vertically in the posterior part of the orbit. Parallel to this line and about one-half inch anterior thereto a second line descends through the orbit and represents the line of junction of the bony septum with the anterior sphenoid face. At the junction of the posterior vertical line and the horizontal line there is a small circle corresponding to the optic foramen. The sphenoid sinus appears as a rhomboid or oval approximately bounded by the two vertical lines. By placing a probe in the sphenoid sinus of a patient

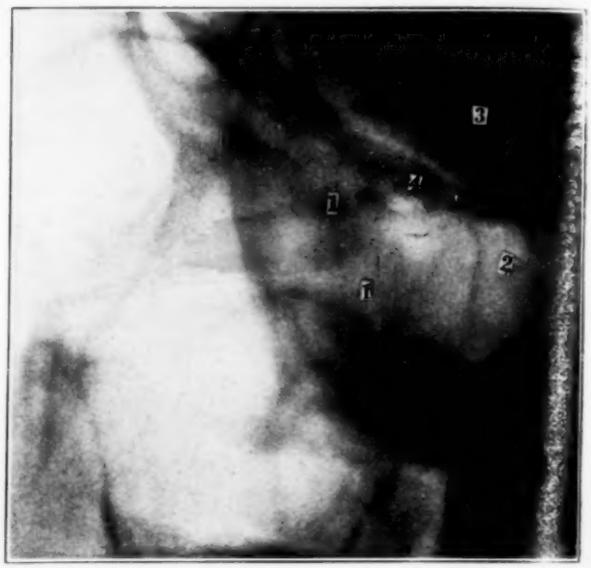

Fig. 4.—Roentgenogram showing anterior ethmoiditis at 1, 1; 2, normal sphenoid; 3, orbital margin; 4, suture line. Note blurring in diseased areas (left side).

and making plates both in the lateral and oblique positions the reading of the sphenoid portion was proved to be correct. The ethmoid cells are bounded above by the horizontal line alone and below by the margin of the orbit, and the fronto-ethmoid cells are noted anteriorly near the floor of the frontal sinus. The latter are clearly shown and the malar eminence is a prominent landmark (Figs. 2 and 3).

If one sets up a mental image of the structures in contact with the median wall of the orbit and adjacent to it, and imagines these structures projected onto this wall, the reading of the plate is much simplified.

The Pathologic Ethmoids and Sphenoid.—When the sphenoid or ethmoid cells contain pus, hyperplastic or neoplastic tissue, the roentgenogram usually reveals the diseased condition. The crisp, sharp normal lines are more or less obliterated and replaced by blurred, washed out or indistinct contours. The pathologic tissue may be revealed as an abnormal shadow of greater or lesser density, varying with the nature and seat of the disease process (Figs. 4 and 5).

With sphenoidal disease the blurring occurs in the posterior part of the orbit. Posterior ethmoidal disease is outlined in the middle portion of the orbit, while with the anterior ethmoiditis the blurring occurs farther forward near the outlines of the nasal process of the superior maxilla (Fig. 6).

The fact that the oblique roentgenogram enables one to locate disease of the anterior or posterior ethmoids or of the sphenoid itself constitutes the chief advantage of this method. In each of two cases an unsuspected polyp was found within the sphenoid when it was opened. In numerous cases controlled by operation, ethmoid disease was accurately located as predicted from the roentgenogram. When polypi were present the larger ones were removed prior to making the Roentgen-ray plates, in order to obviate obscuration of the ethmoid outlines by the polypi. In practically every polyp case a concomitant ethmoiditis was revealed by the Roentgen ray.

It frequently happened that ethmoiditis was not depicted on the frontal plate taken in each case, but was clearly shown on the oblique plate. However, the accuracy of diagnosis will be increased by employing both methods, which should be done in all cases. While positive plates are of great value in checking up clinical findings, negative plates in doubtful cases are also important and may prevent needless operations. This was well illustrated in the case of a physician who had elsewhere been told that he required an ethmoid operation. As soon as he was informed that his plates were negative all of his symptoms disappeared.

It should not be assumed, however, that absolute reliance can be placed in the roentgenograms without regard to clinical symptoms. In a few cases the plates proved misleading, since operation failed to entirely confirm the roentgenogram diagnosis. Sources of error are encountered if the sinuses of the two sides vary considerably in the natural thickness of their

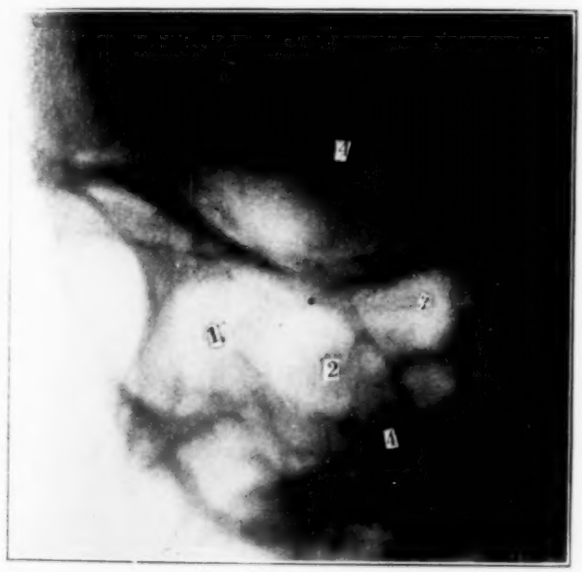

Fig. 5.—Roentgenogram showing 1, anterior, and 2, posterior ethmoiditis; 3, normal sphenoid; 4, orbital margin. Note blurring in diseased areas (left side).

walls, with a resulting contrast in the roentgenogram. Furthermore, as pointed out by Rhese[4] and as we know from transillumination, a healed process in an accessory cavity may still appear as an abnormal shadow. As a general rule, however, reliance may be placed on the Roentgen findings.

Considering the important anatomic relations of the sphenoidal and ethmoidal cavities as well as the possible dangers attendant on operations therein, we should make careful clinical study of each case, and in addition, roentgenography should be employed as one of our most valuable aids to diagnosis.

Fig. 6.—Roentgenogram showing involvement of 1, anterior, and 2, posterior ethmoids, and 3, the sphenoid. 4, 4, orbital margin; 5, suture line (right side).

SUMMARY

The usual methods of roentgenography of the sphenoid and ethmoid cells give uncertain results.

The oblique method is the most valuable and accurate. Both the oblique and sagittal methods should be employed.

The roentgenogram is a great aid to diagnosis and should be combined with careful clinical study.

Venereal Disease.—I have said that venereal disease ruins but does not kill. It does not select itself out by death. The deaths from venereal disease in the British army have rarely ranked more than one to 1,000 of strength, while the cases have ranked as high as 500, and only in the last few years have got as low as 100. Deaths from venereal disease in the civil population of England and Wales were, for 1909, from syphilis 47 per 1,000,000; from gonorrhea, one per 1,000,000. The total deaths from syphilis in Paris in 1909 were 0.397 per 10,000 inhabitants, of which 0.24 per 10,000 were of children under 1 year of age. The deaths from tuberculosis of the lungs were 40.53 per 10,000 inhabitants; from heart disease, 13.67 per 10,000. It is obvious from these figures that venereal disease finds in armies a veritable breeding ground. That such disease is highly dysgenic, i. e., race deteriorating in influence, is indisputable. The frightful effects of syphilis, and its direct communication from parents to children, are fairly well known popularly. But with regard to the serious effects of gonorrhea, the popular mind is not equally well impressed. Indeed, it is too commonly regarded as a mild and not very shameful disease. But medical opinion is really doubtful whether it is not, in some of its effects, as bad as or even worse than syphilis. About 50 per cent. of women infected are made barren by it. Many are made chronic invalids. It is the commonest cause of infant blindness (*ophthalmia neonatorum*). In Prussia, 30,000 such blind persons are to be found.—V. L. Kellogg.

SOME POINTS ABOUT HOOKWORM DISEASE, ITS DIAGNOSIS AND TREATMENT

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If we bear in mind that the enormous territory comprising 66 degrees of latitude and representing a belt running around the middle portion of the earth may be, and generally is, the habitat of the hookworm, we will be impressed with the fact that hookworm disease may be encountered at almost any time and perhaps when least expected.

Observations made on Orientals in the United States Immigrant Hospital, Angel Island, Calif., extending over a period of more than three years, convince us that whenever practitioners are consulted by an Oriental a microscopic search for hookworm ova should be made just as much a part of the routine examination, in all cases in which the diagnosis is not apparent or is at all doubtful, as is the routine examination of the urine, the blood or the sputum.

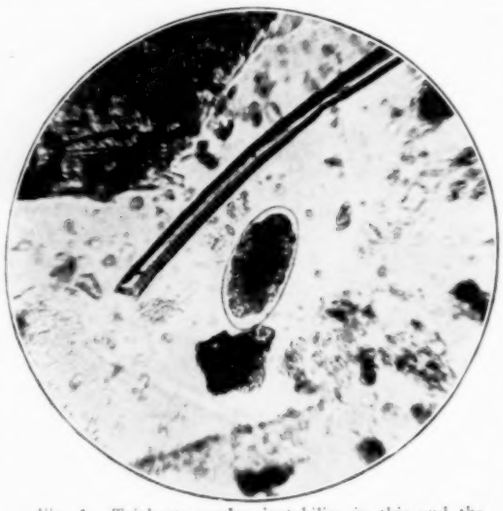

Fig. 1.—Trichostrongylus instabilis; in this and the following illustrations, the ocular is 10× and the objective 4 mm.

Possibly the fact that some of us are not quite familiar with the preparation of specimens for hookworm examination or with the appearance of the ova of this parasite in the stools has acted as a deterring factor in making search for evidence of this disease a routine practice. We are all naturally liable to consider measures with which we are not perfectly familiar as possibly requiring some degree of special aptitude or training; but we can lay aside any disinclination to make a routine search for hookworm ova, if our hesitancy is founded on the fact that we are not quite familiar with its appearance, because the discovery and identification of these ova in the feces is not a particularly difficult piece of microscopic work. It takes no longer and it is no more confusing than a thorough microscopic examination of a urinary sediment. There are only a few things which may possibly be confused with the hookworm egg, and a very limited experience will enable the average observer to differentiate these, at least from a practical standpoint, even without resorting to micrometry.

From Sept. 22, 1910, to Jan. 1, 1913, 6,428 stools of Oriental aliens were examined in the hospital, and 3,320, or over 50 per cent., were found to be infected with either *Ankylostoma duodenale* or *Uncinaria americana*. If these figures are borne in mind and also the fact remembered that similar aliens, as will be shown later, proceed without examination to all parts of our country to reside both in cities and in the outlying territory, it is apparent that the general practitioner has certainly an even chance of finding hookworm disease in any Oriental presenting himself for treatment for any condition, especially if the condition seems to be at all obscure. Coupled with this knowledge, the further fact should be remembered that it is the universal custom of truck gardeners in Japan and China to use human excreta as a fertilizer; and when one considers that many Orientals in this country are engaged in truck gardening as an occupation, one may draw one's own conclusion as to the number of foci of infection established in the United States. It is our opinion that hookworm disease is contracted by unconscious coprophagy (from raw vegetables) to a decidedly greater extent than is generally supposed to be the case. This opinion is supported by the fact that we have several times found hookworm ova in the stools of bound-footed Chinese women — persons who never even in their own homes have gone barefooted. We have found hookworm disease present in a large proportion of Chinese merchants who, after a residence in the United States of from fifteen to forty years, have been to China for a year's visit and then returned to this country, and who during their stay in China did not engage in agricultural pursuits, and when questioned denied having gone barefooted. Their statements have been substantiated by the facts that their financial condition did not necessitate their engaging in such pursuit, and their long residence in the United States had taught them the "shoe habit" to such an extent that they would probably not depart from it; and we have found a large percentage of infection in people from Hongkong and Canton who have never lived in a rural district. Coupled with this evidence is the fact that notwithstanding the high percentage of hookworm disease observed here, we rarely find lesions of an active ground itch or indications that such a condition has recently been present.

Because we find that it is quite impossible to judge simply from the appearance of an Oriental whether or not he is suffering from hookworm disease, the statement of Manson that "the secret of the diagnosis of ankylostomiasis, like that of many other diseases, is to suspect its presence" is fully borne out. Many persons present themselves for examination who are robust and even athletic in appearance, but whose feces on microscopic examination give positive results. It may be that owing to a mild infection, or possibly because of immunity conferred by generations of hookworm infected ancestors (assuming that the anemia of hookworm disease is the result of the presence of a toxin), these people will themselves never suffer to any great extent because of their infection; but they are nevertheless foci of danger if allowed to remain uncured.

The impossibility of diagnosing hookworm disease in this class of patients without the aid of the microscope was so frequently exhibited at this hospital that for one year all aliens were weighed, measured as to their height, and a note kept as to the degree of robust-

ness and whether or not they presented any signs of anemia, lassitude, etc. Moreover, these men were all stripped and subjected to a thorough physical examination before search for the hookworm ova was made, and it would be unlikely that any physical characteristic pointing toward uncinariasis would be overlooked. The result of this tabulation bore out the impression that, if accurate results were to be obtained, the general appearance of a person must be quite disregarded and the microscope used as a routine measure in every case. Symptoms, such as anemia of the upper lip, pallor, "angels wings," dyspnea, etc., were noted in but a comparatively small percentage of these aliens. Possibly the majority of this type of cases are "hookworm carriers"; but even if so, that does not alter what should be the attitude of the general practitioner toward any Oriental patient: The possibility of hookworm disease should not be forgotten, and the microscope should be used as a routine measure before eliminating that possibility.

We have observed a symptom rather common among Orientals when other suspicious signs may be lacking, and, curiously enough, it is a symptom which we have not found mentioned in any of the literature on hookworm disease. We notice, more or less developed in a considerable proportion of infected young persons, and in a few cases even in persons younger than 15 years, a condition corresponding in appearance to an arcus senilis. There is some explanation why this premature change in the cornea should take place in hookworm disease, as it is a condition of fatty degeneration, which degeneration may easily be attributed to the anemia usually secondary to hookworm infection. One other condition which is of some value in a tentative diagnosis and very frequently leads to suspicion is the claim of an age considerably in advance of that which the appearance of the alien would indicate.

Fig. 2.—Note comparative size: *a*, Ankylostoma duodenale; *b*, Trichostrongylus instabilis; *c*, Trichocephalus dispar; *d*, Ascaris lumbricoides (with albuminous covering).

It being a question of a comparatively few years since the government assumed the position that uncinariasis was a dangerous contagious disease, it follows that great numbers of Orientals were admitted to the United States, largely to engage in mining and railroad construction, in both of which the environment favors the establishing of foci dissemination, without hookworm examination. Even at the present time a considerable proportion of arriving Orientals cannot, under the immigration law, be subjected to medical examination. These exempted persons are "sons of natives" who, although they were born in China and have lived there continuously up to the time of applying for admission to the United States, which in many cases means up to practically 21 years of age, are nevertheless admitted without examination. Many of this class, knowing that they will not be examined here, make no effort to have the parasite eradicated before embarkation.

During the year 1911, which covers the period that is spoken of on the Pacific coast as the "Hindu invasion," about 90 per cent. of all arriving Hindus were found to be afflicted with hookworm disease; but, interestingly enough, a large proportion of those infected were found free from all other intestinal parasites.

The facts outlined will be evidence enough that a routine examination of feces is imperative when approaching a diagnosis in the case of any Oriental, and applies almost as strongly to whites living contiguous to Oriental colonies.

Routine microscopic hookworm examination being, then, a part of our general survey of an Oriental patient (and it need not necessarily be confined to Orientals), the next step is the preparation of the specimen. Here we are fortunate in having to deal with a perfectly simple technic and one which requires extremely little practice to perform expeditiously. Our method is as follows:

1. Take a piece of (preferably) formed stool, approximately the size of a walnut, place it in a porcelain cup, and after adding about 60 c.c. of *cold* water, thoroughly break up the mass with the aid of a wooden tongue depressor. When the suspension is as complete as possible, destroy the tongue depressor.

If the stool is liquid, add an equal bulk of cold water and mix as directed above.

2. After placing over the mouth of the cup two or three layers of wide mesh surgical gauze, strain a portion of the contents of the cup into a centrifuge tube and centrifuge for ten seconds at full speed (which means 2,000 revolutions a minute).

The gauze is thrown away and a new piece used for the next specimen. The cup is emptied of its remaining contents and thoroughly scalded.

3. Remove the tube from the centrifuge, and without disturbing the sediment, pour off the supernatant liquid and refill with cold water to about three-fourths the capacity of the tube.

4. Place a thoroughly clean rubber pad over the mouth of the tube, hold in place by the thumb, and shake vigorously. When preparing two tubes at the same time, extreme care will be necessary that the rubber pads are used on their respective tubes at each shaking.

5. Again centrifuge for ten seconds at full speed.

6. Pour off supernatant fluid as described above, and refill with cold water. Again shake.

7. Centrifuge for ten seconds at full speed.

8. Pour off supernatant fluid, leaving about one-half inch overlying the undisturbed sediment. The specimen is now ready for microscopic examination.

We have found it unsatisfactory to give castor oil in order to obtain a specimen for microscopic examination for the reason that the resulting oily stool interferes somewhat with its manipulation. If any cathartic is necessary, Epsom salt is much to be preferred.

A clean slide is now taken, on which is placed a small amount of sediment. Add sufficient water to nearly cover the slide, mix well, allow to stand for several minutes, and then pour off the surplus fluid.

By adding plenty of water to the sediment the density of the fluid will be lowered, thus favoring the

settling on the slide of the hookworm ova, which have a specific gravity of 1.140. The eggs, when they do not appear in other portions of the slide, will sometimes be found near the edge over which the surplus fluid was poured.

In place of the platinum loop generally used in removing a small portion of the feces from the tip of the centrifuge tube, a better contrivance is a piece of aluminum wire, No. 14 gage, about 9 inches long, flattened at one end and fashioned into the shape of a spoon, with the other end bent into a loop for a handle. This makes an admirable instrument for the work. If we let the slide stand for several minutes before pouring off the surplus fluid, blotting the edge of the slide from which the fluid was poured, we shall have a fairly uniform layer with the hookworm ova adhering to the slide. This method is as accurate as any we have used, with the advantage that the even uniform layer permits rapid work. Care should be taken in using the scoop to get to the bottom of the tube, because, owing to the high specific gravity of the hookworm egg, the nearer the bottom the greater the chance of obtaining the ova. Low power magnification is used, and there is no necessity for a cover glass or for staining. Staining is simply increased work, and only complicates a little what is really an absolutely simple process. It is no more useful than would be the staining of easily recognizable constituents in a urinary sediment.

When one is making a great many examinations and using the same slides over and over again for this work alone, the following method of treating the slides will be found advantageous: Immerse them in a 15 per cent. solution of commercial lye and boil for thirty minutes; then thoroughly wash in hot water, after which immerse in aceto-alcohol, 2 per cent., and allow to remain several hours; then take out and wipe. This process removes grease, and the alkali attacking the glass very slightly roughens it, which occasions a certain amount of adhesion between the slide and the water spread and permits a more satisfactory placement of the latter. This method ruins the slide for blood, bacteria, etc., but there are now in use in this hospital slides which are continually treated by the foregoing method and which are still serviceable after having been used for this purpose alone for over two years.

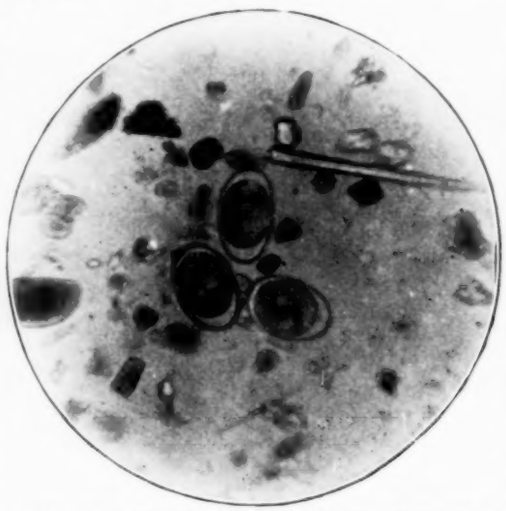

Fig. 3.—Ascaris lumbricoides (without albuminous covering).

In those cases in which a permanent mount of the various ova found in the feces is desired, the method of Surgeon M. W. Glover, U. S. P. H. S., is the most satisfactory. This consists in ringing the slide with asphaltum varnish and mounting the ova-containing sediment in sterilized and filtered sea water.

As previously stated, there are certain things which may be mistaken for hookworm ova; but with a little practice and after one has seen a few times those things which resemble a hookworm egg, there is very little chance for error, although it should be remembered that this egg itself appears in two species, namely, *Uncinaria americana* and *Ankylostoma duodenale*.

The ova of the following parasites may possibly be mistaken for hookworm eggs:

1. *Strongyloides stercoralis.*—We seldom find these ova in the stools except after purgation. They resemble the hookworm egg and are accompanied by rhabditiform larvae which under the microscope show great activity. It should not be forgotten that hookworm ova and larvae of *S. stercoralis* may be seen in the same fresh specimen.

2. *Strongylus subtilis* Looss, *Trichostrongylus instabilis* Railliet, *Trichostrongylus orientalis* (?) Jimbo. This ovum greatly resembles that of *Uncinaria americana* and *S. stercoralis* both in color and size, but with the difference that the vitellus is made up of from eight to thirty-two blastomeres, and the egg itself is perceptibly flattened on one side. There are no larvae to be seen in the stools as in the case of *S. stercoralis* (Figs. 1 and 2).

It may be necessary to wash the gross specimen of feces in order that the parasite may be isolated, in which case a course of treatment should be previously given to insure the delivery of the worm itself for identification. The parasites are about one-half the length of the hookworm, are few in number, and it sometimes requires the washing of several stools before one is recovered, although in the meantime the ova appear in the stools continuously.

If, after washing the stool, careful search has been unsuccessful in revealing hookworm, it is reasonably safe to conclude that the infection is due to *Strongylus subtilis*. These organisms are not found in great numbers, there being usually less than ten and only exceptionally fifty or more in the body. Because of its small size it can easily escape detection. No doubt the eggs of this worm are often mistaken for those of *A. duodenale*. Figures 1 and 2 are characteristic of these eggs. This organism we have found only in Japanese, and it is said to be nonpathogenic. The eggs measure from 0.072 to 0.080 mm. long by from 0.040 to 0.043 mm. broad, while those of *Ankylostoma duodenale* (Figs. 2 and 4) are from 0.056 to 0.061 mm. long by from 0.034 to 0.038 mm. wide, and *Uncinaria americana* from 0.057 to 0.072 mm. long by 0.036 wide. Thus, on the average, the smallest of the three is *A. duodenale*, the middle size *Uncinaria*, and the largest *subtilis*. Again, the ends of the eggs of *A. duodenale* are broadly rounded, those of *Uncinaria* taper toward each pole, while with *Strongylus* only one end is tapering. The ova of *subtilis* contain more blastomeres than the ova of hookworm.

To wash a specimen, sufficient water is added to make a suspension, and it is mixed thoroughly and strained through two layers of wide mesh gauze. The parasite will be found on the gauze, in many cases embedded in mucus, while most of the other constituents of the specimen will filter through. It will be found, if the patient has received the customary prep-

aration in the way of salines before the administration of the anthelmintic, that the stools which follow will be practically odorless, thereby making the process of washing less objectionable.

Worms recovered by washing after oil of chenopodium treatment show no signs of life, while in the first stool after thymol or eucalyptol treatment, many of them exhibit movement.

3. *Ascaris lumbricoides.* These are liable to be confounded with hookworm ova only when they are without the bile-stained albuminous covering; but if we remember that the chitinous shell of the hookworm egg appears linelike, continuous and definite, while that of the roundworm is thicker, and on careful focusing appears double, with the circular nucleus usually more or less bile-stained (Fig. 3), while that of the hookworm is grayish, the two are not liable to be confused. Furthermore, the hookworm egg is of a smaller size and generally of a different shape than the roundworm ovum (Figs. 2 and 4).

4. *Schistosoma japonica.* These eggs assume various shapes in the same specimen, depending on the stage of development, at times resembling *A. lumbricoides* ova and sometimes the ova of hookworm. Pressure on the cover glass will sometimes cause movement of the contaminated miracidium within the shell and often cause the egg to assume an oval outline. Various observers differ considerably as to the usual size of this egg, as illustrated by Table 1.

The following description, by Boviard-Cecil, of this ovum accords entirely with our observations in this hospital:

The ova which are found in the feces nearly always contain miracidia and are larger than the young undeveloped ova. The embryo as it lies in the ovum is pear shaped, with a tapering trunk and sharp pointed proboscis. Its average dimensions are 0.074 x 0.053. It is made up of cells which contain refractile granules and its surface is covered with cilia. If one of the eggs be pressed under a cover glass the parasite can be seen moving about inside the shell membrane.

TABLE 1.—SIZE OF SCHISTOSOMA JAPONICA OVA

Observer	Reference	Size, mm.
Manson	Tropical Diseases, 1914	0.0728 by 0.048
Fujinami		0.0662 by 0.036
Woolley		0.0624 by 0.042
Boviard Cecil	Am. Jour. Med. Sc., 1914	0.065 by 0.031, in uterus 0.074 by 0.053, in feces
Braun	Braun-Siefert: Die tierischen Parasiten des menschen, 1915	0.075 by 0.053 0.090 by 0.075
Brumpt	Precis de parasitologie, 1913.	0.070 by 0.045 0.075 by 0.055

The technic described for the preparation of specimens for microscopic examination is not applicable when searching for the ova of *S. japonica* for the reason that in schistosomiasis intestinalis the gross specimen of feces contains a large amount of mucus, embedded in which are the ova of the parasite. During the preparation of the specimen this mucus containing the ova, being insoluble in water, will not pass through the gauze filter and therefore will impede, if not prevent, the passage of the ova. This condition may be obviated either by using a mucus solvent such as antiformin or, preferably, by making a smear directly from the mucus.

The ova of *Trichocephalus dispar* (Fig. 2) *Oxyuris vermicularis, Bothriocephalus latus* and the various tenias need not be considered, as there is little probability of their being mistaken for the ova of hookworm, unless it be in the case of *O. vermicularis,* which has a thin shell and in some respects resembles *A. duodenale* ova; but its smaller size (0.054 by 0.025 mm., or about the size of whipworm ova), will serve to differentiate.

For those whose microscopes are not equipped for measuring, a practical working method is to visualize the size of the roundworm egg, this ovum being the most constant in size, and then mentally compare with it the size of the ovum under consideration.

It is an interesting fact that almost all Chinese and Japanese who show hookworm infection also show an accompanying infection of roundworm and whipworm, while Hindus usually show only hookworm. Figure 2 shows the ova of these three parasites and their relative size.

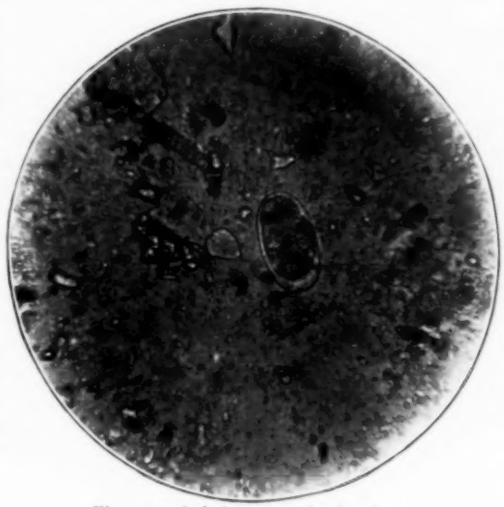

Fig. 4.—Ankylostoma duodenale.

TREATMENT

Thymol is the anthelmintic almost universally administered throughout the United States in the treatment of hookworm disease, and it was used exclusively in this hospital until one year ago, when oil of chenopodium was substituted. Since that time, owing to the encouraging results obtained, oil of chenopodium has been adopted as the regulation treatment to the exclusion of all others, the oil being of the variety known as the Baltimore oil. Compared with thymol, oil of chenopodium gives markedly better end-results, and its value is further enhanced by the facts that not only is it followed by fewer disagreeable after-effects but with its use no dietetic precautions need be exercised either before or during its administration.

The literature on the physiologic and toxic action of chenopodium is limited, but what there is seems to show that there is very little danger connected with the use of the drug unless the doses are excessive and repeated. Motter says:

> Toxicologically a search of the "Index Catalogue" and the "Index Medicus" reveal but twelve published cases of poisoning by wormseed oil in something over fifty years . . . Of these eight were fatal . . . All of the reported cases, however, show a certain general similarity, indicating that the toxic action is exerted particularly on the central nervous system.

It is possible that the drug has a cumulative action, and should this occur, or an idiosyncrasy be manifested, free purgation and stimulation with hot coffee should be instituted at once. We have found the method of administration as recommended by Schuff-

ner and Vervoort to be, with some modification, satisfactory. They give 16 drops (not minims) of oil of chenopodium every two hours for three doses, and a tablespoonful of castor oil with 3 c.c. of chloroform two hours after the last dose of chenopodium. In our experience this dose of chloroform was followed in a considerable percentage of cases by vertigo and stupor, and several times by a temporary deafness which lasted for two or three days. This led to trying a smaller dose of chloroform, which was found to be fully as efficacious in its results as the larger dose, and to eliminate the untoward symptoms mentioned. We prefer administering the oil on sugar rather than giving it in capsules, emulsion, or in tablet form.

Our routine course of treatment for adults is as follows:

Preparatory treatment: At 7 a. m. magnesium sulphate, saturated solution, 60 c.c., is given. At 7 p. m., sodium sulphate, saturated solution, 90 c.c. The next morning chenopodium is commenced, proceeding as follows:

7 a. m., oil of chenopodium, 15 drops.
9 a. m., oil of chenopodium, 15 drops.
11 a. m., oil of chenopodium, 15 drops.
1 p. m., castor oil, 18 c.c.; chloroform, 2 c.c.
1:30 p. m., plain castor oil, 30 c.c.
2 p. m., a cup of hot tea.

In Table 4 are shown the comparative results obtained in our last 300 cases treated with thymol and the last 300 treated with oil of chenopodium.

Chloroform seems to have a marked synergistic action, as giving chenopodium and omitting chloroform from the castor oil has been tried but with inferior results.

A eucalyptol-chloroform-castor oil mixture has given results far below either chenopodium or thymol.

TABLE 4.—NUMBER OF TREATMENTS REQUIRED WITH THYMOL AND OIL OF CHENOPODIUM

Thymol (300 Cases)		Chenopodium (300 Cases)	
Number	Per Cent.	Number	Per Cent.
1	74	1	266 or 87
2	15 plus	2	34 or 13
3	6 plus		
4	2 plus	None over 2 treatments.	
5	0.5		
6	0.7		

Our experience with betanaphthol has been limited, owing to the discouraging early results obtained.

The drop dose of chenopodium is measured from an ordinary medicine dropper, which equals about 3 drops to 1 minim; 15 drops equal approximately 6 minims.

Chenopodium is administered to nursing mothers, the nursing of the infant being interdicted during the treatment day and for twenty-four hours after taking

TABLE 2.—DIFFERENTIATION OF OVA

	Shell	Shape	Contents	Average Size, mm.
Ankylostoma duodenale	Thin	Oval	Grayish	0.06 by 0.04
Trichostrongylus instabilis	Thin	Oval, flattened on one side, more pointed at one pole.	Dark gray to brown	0.076 by 0.0415
Schistosoma japonica	Thin; sometimes double contour.	Oval	Pale yellow to yellowish brown; granular or containing miracidium.	0.074 by 0.053
Ascaris lumbricoides	Thick; double contour*	Round or oval	Bile stained	0.065 by 0.045

*Applies when devoid of albuminous covering.

The dosage of oil of chenopodium from 6 to 7 years is 5 drops; from 8 to 9 years, 7 drops; from 10 to 11 years, 10 drops; from 12 to 15 years, 12 drops; 16 years and over, and under 60 years, 15 drops.

A varying amount of the stock solution of chloroform-castor oil mixture is used, depending on the age of the patient, and sufficient castor oil added to make the total dose 20 c.c. In the second column of Table 3 is indicated approximately the amount of

TABLE 3.—DOSAGE OF THE CHLOROFORM-CASTOR OIL MIXTURE

Age	Dosage, c.c.	Chloroform, Minims	Castor Oil, c.c.
From 6 to 7 years	6	11	14
From 8 to 9 years	8	12	12
From 10 to 11 years	12	15	8
From 12 to 14 years	14	20	6
From 14 to 15 years	16	25	4
Over 15 and under 60	20	30	...

chloroform per dose in minims. The stock solution contains: chloroform, 2 c.c.; castor oil, 18 c.c.; one dose is 20 c.c. This dosage is to be used in conformity with apparent age only.

On the sixth day after treatment the stool is examined and, if found positive, another course of treatment is given and the stool again examined at the end of the second six days. It is not necessary to place limitations on the diet as is the case in using thymol.

the chloroform-castor oil mixture. There have been no untoward symptoms affecting the child. We have had no experience with the administration of the oil of chenopodium during pregnancy, as pregnant aliens diagnosed as having uncinariasis are generally paroled on bond and returned to the hospital for treatment after the child is born, and we have not cared to chance the possible indirect oxytocic properties of an essential oil in this class of cases, there being practically no literature on this phase of the subject. In the series of cases treated with oil of chenopodium the ages of the patients range from 6 to over 60 years and represent many whose physical condition was below par, owing to the inroads of hookworm disease. As to the toxicity of chenopodium, we so far consider it absolutely safe when given in the doses mentioned above, nothing having occurred to cause a contrary opinion, and it has the additional value that it expels not only the hookworm but to a large degree also the roundworm, whipworm, tapeworm and the intestinal flukes.

The accompanying pictures are untouched photomicrographs of specimens obtained from patients in this hospital.[1]

1. In addition to the references already given, the following will be found of interest:
Castellani and Chalmers: Tropical Medicine, 1913.
Dock and Bass: Hookworm Disease, 1910.
Stitt: Practical Bacteriology and Parasitology, 1910.
Brumpt: Precis de parasitologie, 1913.
Braun and Seifert: Die tierischen parasiten des Menschen, 1915.
Katsurada: Centralbl. f. Bakteriol., 1914, lxxii, 363.
Jimbo: Annotationes Zoologicae Japonenses, 1914.

THE DYSCHROMIAS OF SYPHILIS*

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The late R. W. Taylor[1] held that the color changes occurring in the skin as a result of syphilis could be separated into two distinct groups, true pigmentary syphilodermas, and pigmentations and leukodermatous conditions developing in the course of syphilis, as relics or sequelae of lesions, chiefly secondary, and which might be considered as dyschromatous accidents. Taylor believed, with Maieff,[2] that the pigmentary syphiloderm was due to a chronic specific inflammation of the capillaries of the skin, with ensuing endarteritis and occlusion of the affected vessels. As a result of this circulatory disturbance, the red cells lost their pigment, and the escaping coloring matter permeated not only the walls and adventitia of the vessels, but the connective tissue cells, and those of the derma and malpighian layer as well.

Fig. 1 (Case 1).—Retiform pigmentary syphiloderm.

Fig. 2 (Case 2).—Marmoraceous pigmentary syphiloderm.

Fig. 3 (Case 3).—Pigmentary syphiloderm involving only the mucous membrane.

In view of the fact that this attractive theory of the heterogenous origin of pigment has been generally abandoned, I believe we should include all of the various pigmentary changes under the general heading of "syphilitic dyschromias" (Stedman[3] defines dyschromia as "any abnormality in the color of the skin"), although it may be well to accept Taylor's suggestion, at least in part, and separate the dyschromias into two groups, a primary group, which embraces the retiform pigmentary syphiloderm and the marmoraceous pigmentary syphiloderm, and a secondary group, which includes all cases in which the hyperpigmentation or the depigmentation is directly traceable to the presence of previously existing syphilitic lesions of other types.

The subject is rather an elusive one, and probably the best method of clarifying it is by means of series of illustrative case reports, together with a brief discussion of the histopathology.

The following history is that of a fairly typical example of the retiform pigmentary variety:

CASE 1.—A. B., housewife, aged 29, referred by Dr. N. E. Lake of Kansas City, Mo., had no history of a chancre, and, so far as the patient could recollect, the skin had always been free from papular and ulcerative lesions. Two years previously, however, she had suffered for several weeks with a "raw throat," and at that time she was also troubled with stomatitis. The discoloration from which relief was sought involved only the lateral surfaces of the neck and the posterior two thirds of both cheeks, and had been present eighteen months. It had begun in the clavicular regions, and had spread quite rapidly, the maximum degree of pigmentation being reached in the course of a few weeks. The white spots, which were circular or oval in outline, and about 0.2 cm. in diameter, had also developed quickly after the brownish patches had been present for about six weeks. The patient thought, when these areas first commenced to appear, that the skin was regaining its normal color, but the further course of the disorder soon disabused her mind of this hope. There had been no change in the character of the eruption during the past twelve months. The posterior cervical, axillary, epitrochlear and inguinal lymph nodes were infiltrated and palpable, and the serum reaction strongly positive (++++).

Instances of the marmoraceous variety, of which the following case is a good example, are comparatively rare.

CASE 2.—F. L., housewife, aged 34, referred by Dr. T. J. Beattie of Kansas City, Mo., had had the pigmentary disorder for about one year, and its appearance had changed but little, if at all, during the preceding four months. The parent disease had been contracted two years before, a typical primary lesion having developed in the vulvar region at that time. The chancre had been followed by a generalized roseola, with the development of a positive serum reaction, but the eruption had disappeared quite promptly under heavy mercurial treatment. The skin then remained clear for several weeks, when the peculiar, dappled leukodermatous condition became apparent in the scapular and postcervical regions. The spots were milk-white in color, and rounded, oval or irregular in outline, with slightly hyperpigmented areolae. Subjective symptoms and sensory changes were absent, and the lesions had failed to respond to intensive treatment with both arsenic and mercury.

Pigmentary lesions of the mucous membranes are, in my experience, of rare occurrence. During the past eighteen months, however, I have encountered two well marked examples of this form. Both were in women:

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

* This paper, and those by Drs. Wile and Elliott, and Schamberg, Kolmer and Raiziss, which follow, are part of a symposium on syphilis. Of the remaining papers, those by Drs. Matthew A. Reasoner and Harold N. Cole appear in THE JOURNAL for December 16; those by Drs. William B. Trimble and John J. Rothwell and by Dr. H. G. Irvine and the discussion will appear in THE JOURNAL for December 30.

1. Taylor, R. W.: New York Med. Jour., 1893, lvii, 177.
2. Maieff: Compt. rend. Cong. internat. de dermat. et de syph., Paris, 1890.
3. Stedman, Medical Dictionary New York, 1915, p. 274.

Case 3.—L. J., housewife, aged 46, a native and resident of Texas, referred to me by Dr. Nellie Kenefick of Kansas City, Mo., two years previously had contracted a virulent case of syphilis from her husband. The throat lesions were unusually severe, and the cutaneous manifestations had proved resistant to treatment. The serum reaction had remained strongly positive, almost from the beginning, and despite treatment. The presence of some small, dark brownish macules on the vermilion border of the lips and the inner surfaces of both cheeks was first noted about eight months after the appearance of the chancre. At this

Fig. 4 (Case 5).—Postpapular pigmentary syphiloderm; generalized distribution.

time a physician in Baltimore, where the patient was then visiting, was consulted, and on learning the history of the case, again instituted treatment by mercurial injections. Following this, the lymph node infiltration gradually subsided, but the pigmentary lesions persisted. A few months later, and about one and one-half years after the disease had been contracted, the blood still showed a strongly positive reaction, and the dyschromatous lesions had changed but little if at all in character. At the time the case came under my observation the only evidences of syphilis that persisted were the positive Wassermann and luetin reactions, and the brownish macules on the lips and inner surfaces of the cheeks. Permission to perform a biopsy was refused.

Case 4.—The second patient, who was referred by Dr. Ernest F. Day of Arkansas City, Kan., presented a less striking clinical picture. The lesions, which were brownish or blackish, oval or elongated macules, varied from 0.1 to 0.5 cm. in their longest diameters, and were located on the inner surfaces of the cheeks, near the interdental lines, and on the mucous surface of the lower lip. They had developed during

Fig. 5 (Case 6).—Syphilitic dyschromia of localized type.

the second year of the disease, which was of ten years' standing at the time of consultation.

In postpapular pigmentation, the localization of the lesions is dependent on the distribution of the preceding papular elements. The eruption may be generalized, and symmetrical, but often it is confined to one or more areas on the face, trunk or limbs. The lesions are the size of a pinhead or larger, circular or oval in outline, and of asymmetrical distribution, and give rise to no subjective symptoms. As in all dyschromias, the color does not disappear under pressure. The following example of postpapular pigmentation represents a not uncommon type of this variety of the affection.

Case 5.—In A. F., housewife, aged 32, referred to me by Dr. Frank J. Hall of Kansas City, Mo., the lesions had developed following the disappearance of a papular eruption which had been present about six weeks. The mucous membranes were not involved. The blood gave a strongly positive Wassermann reaction (++++).

The pigmentary deposits occasionally seen in late secondary syphilis may be quite sharply localized instead of being of more or less universal distribution.

Case 6.—In L. C., stockman, aged 42, referred by Dr. H. B. Savage of Galena, Kan., the dyschromia was confined to the outer surface of the right foot, and had been present for more than four years. The original infection had been acquired six years prior to the time of consultation. The pigmentary lesion was roughly oblong in outline, and measured 5 by 15 cm. So far as the patient knew, the discoloration had not been preceded by ulceration of any kind. He attributed its development to pressure from an ill-fitting boot. The lesion was of a dark brownish hue, and presented the characteristic appearance of dyschromia due to syphilis.

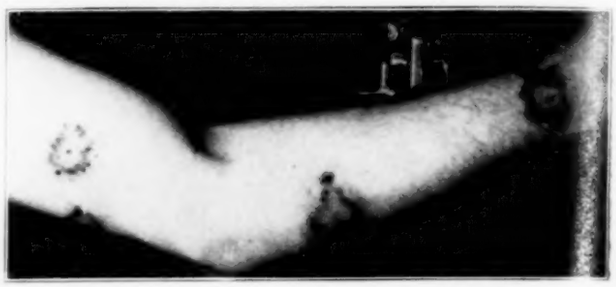


Fig. 6 (Case 7).—Pigmentation following tubercular syphiloderms.

Pigmentation following tubercular syphiloderms is of common occurrence. Occasionally, as in the following instance, the lesions may assume circinate as well as serpiginous outlines.

Case 7.—M. P., laborer, aged 41, referred to me by Dr. R. C. McClure of Kansas City, Mo., had an indistinct history of the presence of a chancre eight years previously. The tubercular lesions had developed three years prior to the time of consultation, and had given rise to slight superficial ulceration, with some resultant scarring. Their distribution was roughly symmetrical, and both the upper and lower extremities were involved. The pigmentary lesions were circinate in outline, and completely encircled the atrophic patches left by the preceding lesions.

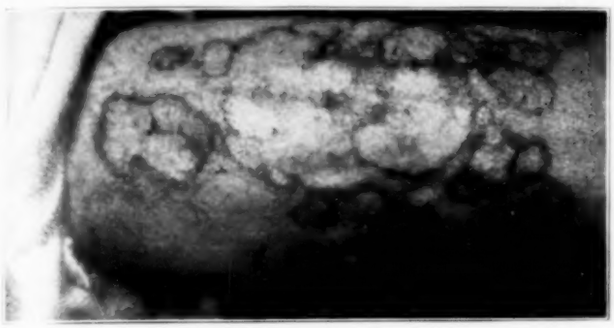
Case 8.—In this following case, which also developed following syphiloderms of the tubercular variety, the dyschromia was even more striking. B. R., man, jeweler, aged 43, referred by Dr. C. M. Stemen of Kansas City, Kan. The disease had been acquired during the patient's thirtieth year, and the earlier cutaneous manifestations had disappeared promptly under mercurial treatment. The tubercular lesions had developed on the right leg, eleven years later, and they too yielded promptly to the action of arsenic and mercury. Thin, smooth, flexible scars persisted, however, with a considerable degree of brownish pigmentation which had gradually increased in degree during the succeeding twelve months.

Examples of decoloration due to syphilis are much rarer than instances of hyperpigmentation. A most striking example was found in a negro subject:

CASE 9.—A. F., negro, laborer, aged about 40, referred by Dr. Darwin Delap of the University of Kansas, School of Medicine, was positive that the white spots had first become apparent about four years prior to the date of consultation, though the history of the parent disorder was not clear. The depigmentation had begun in the lumbar region, and had followed the development of "lumps" in the skin. On examination it was found that the process involved one large and several small patches, arranged in a roughly oblong manner. The principal area was located in the dorsal and lumbar regions, and contained several small islands of hyperpigmented skin. Its upper boundary consisted, for the most part, of two long, slightly undulatory, superficial syphiloderms of the tubercular variety, which converged to form a spear-shaped point directly over the spinous processes of the dorsal vertebrae. Some of the smaller leukodermatous patches in the lumbar region had begun to assume a brownish hue, as if pigmentation were again taking place. The decolorized areas were smooth and unctuous to the touch, and there were no signs of cicatrization. The skin on other parts of the body, as well as the mucous membranes, was unaffected. The serum reaction was strongly positive (++++). The tubercular lesions healed promptly under antisyphilitic treatment.

HISTOPATHOLOGY

For laboratory study, specimens were excised from both the pigmented and pigment-free areas in Case 1, from the pigmented areas in Case 3, and from the



7 (Case 8).—Pigmentation following tubercular syphiloderms

...l, leukodermatous, and hyperpigmented (island) ... in Case 9.

... staining purposes, various dyes were employed, ...ugh dependence was placed, for the most part, ...matoxylin-eosin, and the Unna-Pappenheim and ...owsky-Grund methods. To one who has studied, ...en reviewed, the extensive German literature on ... ...romias in general, the microscopic findings were ... from satisfying. They may be summarized as ...ows:

... 1.—In the pigmented areas the papillae were normal in ..., and the vessels apparently but little affected. The basal layer of the epidermis contained large numbers of pigment granules, and in some instances the presence of these minute collections of coloring matter could be traced well up into the prickle layer of the skin. Deep in the corium some of the vessels exhibited both endovascular and perivascular changes, but this was not a marked feature in any of the specimens. In the leukodermatous areas the papillae were much flattened or totally absent, and the pigment granules in the lower regions of the epidermis were either greatly decreased in number, or entirely absent. A specimen from the margin of one of the white spots showed that the pigmentary changes were gradual, and far less abrupt than one would expect from the sharp contour of the leukodermatous patches. The corneous layer was unchanged in all of the specimens from this case. No pigment was found in the corium.

CASE 3.—The papillae were ...bsent or had ab...lutely disappeared. The vessels in the corium exhibited both endovascular changes and perivascular infiltration (small round cells and plasma cells). The pigment, which was confined to the

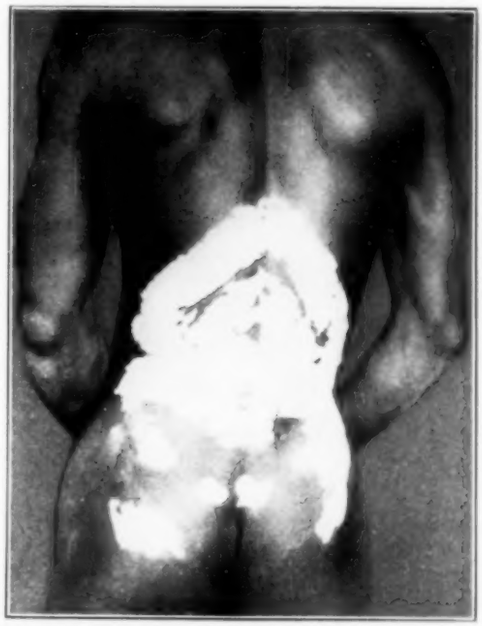


Fig. 8 (Case 9).—Depigmentation due to syphilis, the patient being a full-blooded negro; the islands are hyperpigmented; in the lower portion of the affected area repigmentation is gradually taking place.

areas directly overlying the plasmoma, gave a negative reaction for iron (when tested with ferrocyanid and hydrochloric acid, through the courtesy of Dr. Frank J. Hall), and was for the most part confined to the basal layer of the epidermis. The coloring matter was insoluble in alcohol, ether, water, weak alkalies and weak acids. The prickle layer was slightly

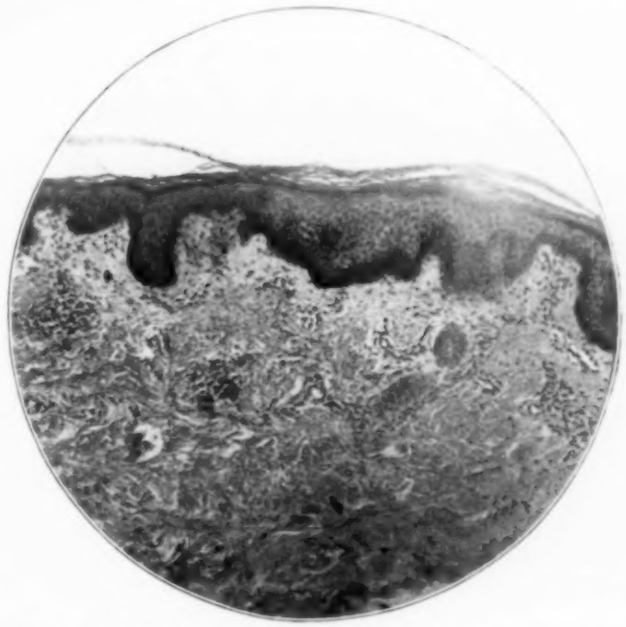


Fig. 9.—Section of normal skin in Case 9; the pigment granules are practically confined to the basal layer of the rete.

increased in thickness, and a few masses of pigment could be found in the upper layers of cells. Degenerative changes were absent. The granular layer was unaffected. The stratum corneum was slightly parakeratotic. No pigment was found in the derma.

CASE 9.—The specimens from the normal areas exhibited the structural characteristics of negro skin, although the vascular changes typical of late syphilis also were present. The pigment was confined to the basal layer of the epidermis and to the cells immediately overlying it. In the sections stained with hematoxylin-eosin, the pigment stood out plainly as golden brown particles within and between the cells.

In specimens from the leukodermatous areas, a few of the papillary bodies still persisted, although the seat of widespread

Fig. 10.—Section from a depigmented area in Case 9; the epidermis is absolutely free from coloring matter of any kind; a few of the papillae still remain; the vascular changes which are characteristic of syphilis are apparent throughout the derma.

plasma cell and round cell infiltration. The vascular changes in the derma of these specimens were very marked. Aside from the absence of pigment of any kind, the epidermis was but little changed. The skin excised from the islands exhibited some papular hypertrophy, together with the vascular changes which were so conspicuous a feature in all of the specimens from this case. The masses of pigment were not confined entirely to the basal layer of the epidermis, but extended upward, sometimes to a point immediately underlying the granular layer. The stratum corneum was slightly thickened, but no coloring matter was found in or above the stratum granulosum. In none of the specimens examined was pigment found in the corium. In a few instances in which the section had been cut obliquely, the specimens gave the appearance of pigment in the corium; but when the specimen was reconstructed it was invariably found that the particles of pigment were in reality confined to basal epidermal cells which had been cut off during the process of sectioning.

COMMENT

The source of epidermal pigment is not definitely known. Hutchinson's[4] conclusion that pigmentary lesions of the neck are manifestations of suprarenal disturbance has not received general acceptance.

The present status of our knowledge of the subject has been admirably summarized by Meirowsky[5] in a few lines. Kolliker[6] and Caspary[7] conclude that all branched cells of the epidermis are wandering connective tissue cells. Ehrmann[8] asserts that the pigmented epidermal cells develop from mast cells, and have nothing to do with leukocytes, epithelial cells or connective tissue cells. Riehl,[9] Abby,[10] Meyerson[11] and Rabl[12] hold that they are in part emigrant leukocytes. Schwalbe,[13] Unna[14] and Kromayer[15] consider the branched pigment bodies as acellular structures, which, according to Kromayer,[15] Jarisch,[16] Post[17] and Grund,[18] develop from common or ordinary epithelial cells. The results of Hellmick's[19] researches also indicate that the coloring matter is a direct product of the epidermal cells, and not a hematogenetic substance which has been conveyed to the epidermis by chromatophores. Hellmick concludes that the epidermis has in itself the power of forming pigment, and that the nuclear substance is probably the mother substance of this pigment. Hooker[20] has experimentally shown that stellate pigment cells can be grown in plasma cultures of frog epidermis. Spiegler has demonstrated that none of the high chemical products of the coloring matter of hemoglobin can be obtained from the pigment of the hair, so that the origin of hair pigment from hematin seems impossible. Judging from the results of the work of other investigators as well as from my own experience in the cases herein reported, I believe that the pigment matter is entirely a product of epidermal metamorphosis, and that the plasma cells and connective tissue cells have little or nothing to do with its formation. The fact that in some instances repigmentation occurs following the development of leukodermatous areas would indi-

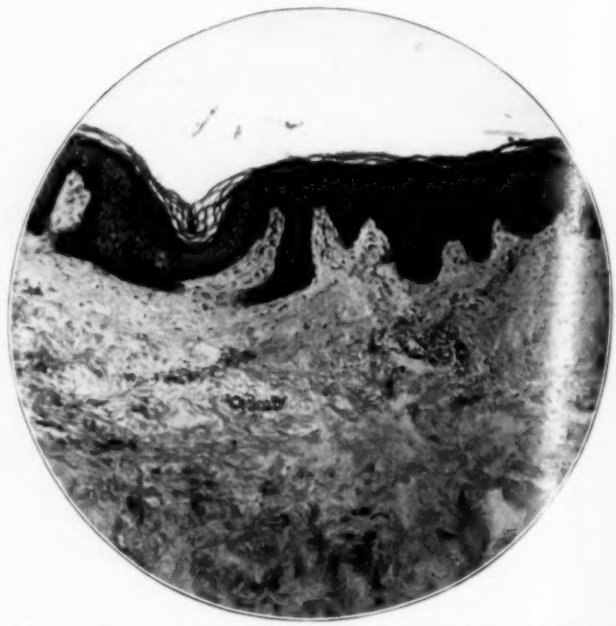


Fig. 11.—Section from one of the "islands" in Case 9 illustrating the papillary hypertrophy, the vascular changes in the derma, and the large amount of pigment scattered throughout the prickle layer.

4. Hutchinson: Syphilis, New York, 1913, p. 557.
5. Meirowsky: Monatsh. f. prakt. Dermat., xlii, 151; ibid., xliii, 391; Ueber den Ursprung des melanotischen Pigments der Haut and des Auges, Leipzig, 1908.
6. Kolliker: Ztschr. f. wissensch. Zool., 1883, p. 174.
7. Caspary: Verhandl. a. d. X internat. med. Kong., Berlin, iv; Verhandl. d. deutsch. dermat. Gesellsch., Berlin, 1906; Mracek's Handbuch, ii, 571.
8. Ehrmann: Bibliot. med., ii, No. 6, Cassel, 1896; Arch. f. Dermat. u. Syph., 1892, p. 397; Brit. Jour. Dermat., 1890, p. 280.
9. Riehl: Vrtljschr. f. Dermat. u. Syph., 1884, p. 83.
10. Abby, cited by Meirowsky, Footnote 5.
11. Meyerson: Arch. path. Anat., 1889, cxviii, 197.
12. Rabl: Ergeben. f. Anat. u. Entwcklngsgesellsch., vi, 493, Zt. nach Grund.
13. Schwalbe: Wien. klin. Wchnschr., 1892, v, 13.
14. Unna: Histopathology; Monatsh. f. prakt. Dermat., 1895, xxi, 1.
15. Kromayer: Dermat. Ztschr., 1897, iv, 335.
16. Jarisch: Verhandl. d. X internat. med. Kong., Berlin, iv.
17. Post: Ueber normale und pathologische Pigmenterung der Oberhautgewebe, J. D., Konigsberg, 1893.
18. Grund: Beitr. z. path. Anat. u. allg. Path., 7 Supplement.
19. Hellmick: Monatsh. f. prakt. Dermat., xliv, 184 (good abstract in Brit. Jour. Dermat., 1908, p. 169).
20. Hooker: Anat. Rec., 1914, viii, 103.

cate that, in at least a certain percentage of cases, the cellular changes are such that it is possible for pigment production to occur again.

The treatment of hyperpigmentation due to syphilis is that of chloasma and similar disorders. Frequent applications of a 1 per cent. solution of mercuric chlorid, in equal parts of alcohol and water, will usually give rise to sufficient desquamation of the epidermis to eliminate the excessive coloring matter, although recurrences are common. If there is too much resultant irritation, a soothing application of zinc oil may be substituted for a few days, when the mercurial preparation may again be resorted to. Constitutional remedies have no effect whatever on the lesions.

A CRITICAL STUDY OF ONE HUNDRED AND TWENTY CASES OF LATE SYPHILIS

WITH PARTICULAR REFERENCE TO EARLY TREATMENT *

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The occurrence of late accidents in syphilis depends on many factors. Among those which constitute predisposing factors in the causation of the so-called tertiary manifestations are trauma, a weak constitution and predisposition of the individual, and malignancy of the infection. Syphilographers of an earlier day and those of the present time agree that by far the most important factor is the lack of or inefficiency of treatment. Fournier, after an analysis of many thousand cases, states that this factor overshadows all others in importance. The efficacy of various mercurial preparations, particularly with regard to their protective value, has been made the subject of numerous studies. At present it seems to be agreed that calomel ranks first in the order of efficiency, and after that, in general, the insoluble preparations in the form of injections; that the soluble salts by injection and the inunctions are of about equal efficiency, and that the method of ingestion is by far the least efficient from the standpoint of immunity from late accident as well as from the standpoint of serologic cure. The ingestion of mercury at the present time is still used extensively by reputable physicians, and its convenience of administration still commends it highly to the patient.

With a view to establishing the relative importance of treatment in the prevention of late sequelae, and with the idea of possibly comparing the various forms of treatment with regard to their respective properties, we began the study four years ago of all late manifestations. During this time we have seen in the neighborhood of 200 cases of gummatous or nodular ulcerative syphilis. In 120 of these cases we have definite criteria as to the amount and type of treatment which was given.

* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

The following points were studied in this group: first, the type of lesion; second, the situation of the lesion; third, the incidence of trauma as a possible factor; fourth, the history of a knowledge of an infection; fifth, the presence of syphilis in the consort; sixth, the length of time elapsing from the beginning of the infection, and seventh, the type and amount of treatment which had been instituted.

TYPE OF LESION PRESENT

Of the 120 cases, fifty-four were gummas or nodular ulcerative lesions in the skin. The position of these lesions is seen in Table 1. In twenty-nine cases the

TABLE 1.—POSITION OF SKIN LESIONS *

Leg	12
Nose	9
Scalp	6
Cheek	5
Foot	4
Hand	4
Knee	2
Forearm	2
Buttock	2
Wrist	2
Toe	1
Abdomen	1
Elbow	3
Ankle	1
Total	54

* In the tables, a few cases in which lesions have appeared in two systems have been counted twice.

mucous membranes were involved (Table 2). The bones and joints were involved in twenty-five cases (Table 3). Visceral involvement was encountered in twenty-two cases (Table 4). Fifty cases presented themselves as gummatous nonulcerative tumors, and seventy as ulcerative lesions.

INCIDENCE OF TRAUMA

The history of trauma was elicited in thirteen cases, and of these ten occurred in or near the bony prominences as the result of direct violence, such as a blow or fall. In one case excessive smoking was considered as a traumatic factor. In another a slight injury to the testis was the predisposing cause for the subsequent gummatous involvement of the organ. Trauma, then, was a factor in only 10 per cent. of the total number of cases. As will be shown later, it can be considered only as a partial factor, as the question of inefficient treatment enters into this group as well

TABLE 2.—POSITION OF LESIONS OF MUCOUS MEMBRANES

Pharynx	9
Soft palate	7
Larynx	5
Tongue	3
Lips	2
Urethra	2
Gum	1
Total	29

as into other cases. From these figures it would seem that trauma is an important factor only when the later manifestations concern the skeletal structures.

HISTORY OF INFECTION

In sixty-three cases there was a definite history of infection. Nineteen of these patients remembered a primary sore. Secondary manifestations were affirmed in sixteen cases, and both primary sore and secondary manifestations in twenty-eight cases. Twenty-four patients affirmed that their consorts had been infected, but, as only a limited number of these consorts could be serologically examined, these figures are of relatively little importance.

LENGTH OF TIME BEFORE MANIFESTATIONS

The study of the length of time elapsing between the period of the chancre and the manifestation of the gummatous lesions showed some interesting figures bearing out those of Fournier. At one extreme forty-four years had elapsed from the time of infection to the appearance of the late accident. At the other extreme but four months had elapsed. The average length of time elapsing for the entire group was ten years after infection. This figure, however, does not represent the fastigium, as over 33 per cent. of the cases developed the late sequelae in the fourth year. The fourth year after infection therefore represents

TABLE 3.—POSITION OF LESIONS OF THE BONES

Hard palate	9
Nasal septum	9
Tibia	4
Humerus	1
Rib	1
Clavicle	1
Total	25

the fastigium, or the year during which tertiary accidents are most likely to occur. The average time of ten years, it will be seen, is made longer by the sequelae in the nervous system which seem to develop at a considerably later period than do gummatous lesions elsewhere.

INFLUENCE OF TREATMENT

A definite history of treatment with particular regard to time of inception and character was obtainable in all the cases studied. Fifty-five cases had absolutely no treatment whatever. In the remaining sixty-five treatment had been inefficient except in a single case. In other words, but one case of the entire group had had what would be deemed, under the accepted criteria of today, intensive treatment.

The last statement requires explanation and qualification. In order not to be too sharply critical of treatment, we took as a standard of efficient treatment prolonged mercurial medication in any form. Thirty-six of our cases had had pill treatment for periods varying from a few weeks to a few months. In ten cases inunctions or injections of mercury had been given for short courses of a few months, and in but eight cases had salvarsan injections been used. Of the last, but one or two injections had been given late in the course of the disease, and in only one of this group had there been subsequent mercurialization. In twelve cases there was a history of liquid medicine in some form taken in a desultory fashion. The one case in which treatment had been efficiently instituted was a precocious malignant syphilis in which three injections of arsenobenzol were given followed by mercurial inunctions. The patient who received this treatment returned four months after the appearance of his chancre with a large ulcerative gumma of the forearm.

To sum up these figures, almost 50 per cent. of the cases had received no treatment whatever, and of the remaining cases in which treatment had been administered, with the exception of a single case of precocious malignant syphilis, the treatment had been desultory and unintelligently carried out.

COMPARISON WITH CASES EFFICIENTLY TREATED

Inasmuch as it was found that over 30 per cent. of the cases occurred before the end of the fourth year, it seems fair to compare this series with a number of other cases which had been observed over the same period of time and in which treatment had been instituted at the outset and carried through intensively. Of such cases we have forty which we have been able to follow for the four years following their infection. These patients have all received repeated injections of salvarsan followed by vigorous mercurialization in the form either of inunctions or injections. Of this number, thirty-six, or 90 per cent., have reached the fourth year without any signs of recurrence, and the largest percentage of these cases are serologically cured. Of the four cases in which there has been recurrence, two patients have returned with central nervous system involvement in the nature of neural recurrences which yielded promptly to treatment. One patient had recurrent mucous patches, notwithstanding vigorous treatment, and the last was the precocious malignant syphilid mentioned before.

The analysis of our cases has convinced us of certain definite factors in the occurrence of late syphilitic accidents. We feel that the element of trauma must be regarded merely as an exciting cause, inasmuch as the more important element of lack of treatment enters into the traumatic cases as well as into those in which the lesions occurred spontaneously. From the large percentage of cases which developed without trauma, it is not unlikely that late sequelae might have developed spontaneously in the group in which there was a history of trauma. The predisposition of the traumatic cases to localize in or around bony structures is easily accounted for by the greater susceptibility of the bony parts to injury.

CONCLUSIONS

1. By far overshadowing all other causes of the appearance of late syphilitic sequelae, the lack of, or inefficiency of treatment during the early period stands out as the most important factor.

2. The inefficiency of treatment by the ingestion of pills is suggested by the fact that in those cases in which treatment was given the largest number had been treated in this fashion.

3. The tendency for late sequelae to appear increases up to the fourth year, which represents a fastigium after which there is a decrease in the probability.

TABLE 4.—POSITION OF LESIONS OF THE VISCERA

Testes	6
Liver	4
Stomach	3
Brain	2
Spleen	2
Aorta	2
Parotid	1
Visceral	1
Thyroid	1
Total	22

4. That no latent untreated cases are immune is suggested by the lapse of forty-four years after infection in one of our cases.

5. Trauma probably plays a smaller rôle in the production of active syphilis during the period of latency than is generally supposed. Where it occurs it is likely to influence the appearance of gummatous lesions in or around the skeletal structures.

6. Intensive treatment as accepted by modern methods (salvarsanization and thorough mercurialization during the early months) is protective in the largest percentage of cases.

7. In treated cases the occurrence of late sequelae, except for isolated and exceptional cases, must be regarded as an indictment against the method of treatment.

THE ADMINISTRATION OF ARSENOBENZOL BY MOUTH *

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In 1912, Drs. John A. Kolmer and Jay Frank Schamberg[1] published an article in which the following conclusions were drawn:

1. Salvarsan can be administered in pills, in capsules and in solution to lower animals in dosage of from 0.02 to 0.0[illegible] grain per kilogram of body weight, without producing toxic symptoms. A dog received 0.57 gm. of salvarsan in pill and capsule form in the course of twenty-nine days without disturbing effects.

2. After the oral administration of salvarsan, arsenic is found in the bile and urine at the end of twenty-four hours, but it disappears by the end of seventy-two hours.

3. Twenty-four hours after the oral administration of salvarsan to cats, the number of bacteria in the intestinal tract appears to be reduced, the reduction being most striking in the lower end of the ileum.

4. Salvarsan administered by mouth and likewise intravenously to rabbits in doses approximately those employed in human subjects does not produce, at least within ninety-six hours following its administration, any appreciable microscopic changes in the important viscera.

5. With the exception of a little vomiting and diarrhea in some cases, salvarsan can be given by mouth up to 0.6 grain to human subjects without producing toxic symptoms. Thus administered, the drug exerts a therapeutic influence, but this influence is too feeble to warrant its use by this route.

The present studies were undertaken to shed additional light on the possibility of employing the gastrointestinal tract as an avenue of administration of salvarsan. In these studies our own product, arsenobenzol, was employed. The experiments carried out were of quite a different character from those detailed in our previous essay on the subject.

The first object of our investigations was to determine the effect of salvarsan administered by mouth on the parasites in the blood of animals infected with experimental trypanosomiasis. These parasites react chemotherapeutically in a similar manner to that of the *Spirochaeta pallida* and offer, therefore, a most excellent therapeutic criterion of the effect of various agents.

The *Trypanosoma equiperdum*, the organism which produces dourine, or horse syphilis, was the parasite chosen by us. The drug was administered to rats and rabbits in solution by means of a stomach tube, and also in the form of pills and in capsules.

Tables 1 and 2 show the results obtained by the administration of arsenobenzol in solution to 19 rats, in doses varying between 1 and 10 mg. per 100 gm., or between 10 and 100 mg. per kilogram. This would represent, for a man weighing 140 pounds, doses varying between 0.7 gm. and 7 gm. The rats were infected by intraperitoneal injection and the drug administered twenty-four hours later. Four control rats were employed; these animals were infected, but received no arsenobenzol.

As happens in most infections of this sort, the control animals were dead at the end of from five to six days, with trypanosomes in the blood stream in uncountable numbers. In those rats receiving the lower doses of arsenobenzol (10 to 40 mg. per kilogram) no appreciable effect was noticed, either as to the time when the trypanosomes first appeared in the blood or as to duration of life. It was only when the dose reached 60 mg. per kilogram that a distinct influence on the parasites was observed. In such animals the blood remained free of trypanosomes for one week, but at the end of this time, the restraining effect of the medicament had disappeared and the parasites appeared in the blood stream, rapidly proliferated, and

TABLE 1.—INFLUENCE OF SINGLE AND REPEATED DOSES OF ARSENOBENZOL ADMINISTERED IN SOLUTION BY STOMACH TUBE ON EXPERIMENTAL TRYPANOSOMIASIS *

No.	Wt., Gm.	Dose per 100 Gm.	Results of Examination of Blood from Tail													
			1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.	8 da.	9 da.	10 da.	11 da.	12 da.	13 da.	14 da.	21 da.
11	80	0.01	—	—	—	—	—	—	—	—	—	+	—	—	—	—	++++
5	74	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	D	
2	105	0.009	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
10	66	0.009	—	—	—	—	—	—	—	—	—	+	—	—	—	—	++++
4	75	0.008	—	—	—	D											
6	73	0.008	—	—	—	D											
7	100	0.007	—	—	—	—	—	—	—	—	—	—	—	—	few	++++	D
8†	92	0.007	—	—	—	—	—	—	—	few	++	++++	++++	++++	D		
9	80	0.006	—	—	—	—	—	—	—	few	++	++++	+	—	—	—	++++
10†	80	0.006	few	++	++++	++++	—	—	—	—	—	—	—	—	—	few	++++
11†	72	0.005	few	++	++++	++++	++++	++++	++++	D							
12†	79	0.005	few	++	++++	++++	++++	D									
13†	82	0.004	few	—	—	—	—	—	—	—	+	++	++	++++	++++	++++	D
14†	82	0.004	few	few	few	—	—	few	few	+	++	++++	++++	++++	D		
15	68	0.003	few	few	+	++++	D										
16	76	0.002	few	+++	++++	++++	D										
17	80	0.002	few	++++	++++	++++	D										
18	78	0.001	few	+++	++++	++++	++++	D									
19	77	0.001	few	—	++++	++++	D										
20	107	Control	+	+++	++++	++++	++++	D									
21	128	Control	+	+++	++++	++++	D										
22	130	Control	few	+++	++++	++++	D										
23	86	Control	few	+++	++++	++++	D										

* Rats infected with 120,000 T. equiperdum twenty-four hours before the administration of arsenobenzol.
† Nos. 1, 4, 8, 13 and 14 received the same size dose again on the tenth day, No. 10 on the fourth day, No. 11 on the sixth day, and No. 12 on the fifth day.

* From the Dermatological Research Laboratories of the Philadelphia Polyclinic.
* Read before the Section on Dermatology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Kolmer, John A., and Schamberg, Jay Frank: Experimental Studies of Administration of Salvarsan by Mouth to Animals and Man, Jour. Exper. Med., 1912, xv, No. 5.

in six days thereafter led to death. In doses of 90 and 100 mg. per kilogram the blood was kept free of trypanosomes for three weeks and in some rats even longer. In one instance a rat receiving 80 mg. per kilogram died on the twenty-third day without any trypanosomes appearing in the blood. This animal may have died as a result of the drug or from accidental causes, as so often happens with white rats.

In a number of animals a second dose was administered after trypanosomes had appeared in the blood; in most instances the parasites disappeared from the blood within twenty-four hours, but returned again in two or more days.

Table 3 shows the effect of the administration of arsenobenzol in enteric pills coated with salol and silver to prevent solution in the stomach. Twelve rats demonstrate that relatively little effect was exerted by the drug in this form. There can be little doubt that most of the drug remained unabsorbed.

In Table 4 the effect of the administration of arsenobenzol in capsules is well shown. In this experiment, ten rats received 5 mg. each of the drug, irrespective of their weight, although large rats were chosen in order to permit of the insertion of the capsules into the pharynx. The dose per weight varied from about 25 to 30 mg. per kilogram. The very interesting finding is here noted that this relatively small dose kept the blood sterile for from five to six days, whereas with the drug in solution, about twice this quantity was necessary to produce the same effect. After the sixth day trypanosomes appeared and all the rats perished by the end of two weeks.

Having demonstrated that arsenobenzol could with safety be administered by mouth to animals, and having observed that the best method of administration was in the form of capsules, we determined to employ this method of administration in the human subject.

During the course of four months, arsenobenzol in capsule form has been administered by us to about thirty patients in various stages of the disease. The drug was given at first in ordinary gelatin capsules, but later in enteric capsules, the gelatin having been previously treated with formaldehyd, in order to prevent the capsules being absorbed in the stomach.

We have been able to study the effects of arsenobenzol administered in capsules on the various lesions of syphilis. In a general way, it may be stated that the effect of the drug on the secondary eruption is much slower than after intravenous injection. Ordinarily it requires about three weeks to cause the disappearance of a macular or papular eruption with the doses administered by us. In one case, however, a large papular syphilid of the face disappeared in three or four days, with almost the degree of rapidity that it would after an infusion of the drug into the blood. Tertiary nodular lesions required from two to three weeks' administration to effect their disappearance.

Formula for administration: In order to prevent oxidation of the arsenobenzol in the capsule we incorporated with it a very remarkable reducing substance, sodium hydrosulphite, which is used in the production of salvarsan. The formula employed by us for each capsule was as follows:

		gm. or c.c.	
℞	Arsenobenzol	0.03	gr. ss
	Sodii hydrosulphitis	0.015	gr. ¼
	Bismuthi subgallatis	0.12	gr. ii

Sig. One after each meal with water.

The bismuth subgallate was incorporated to lessen the likelihood of inducing diarrhea.

Tolerance: In most patients these capsules were well borne and did not provoke any gastro-intestinal distress. Some patients were able to take the capsules continuously for a period of six weeks without complaint. In the course of a week a patient ingested more than 0.6 gm. of the drug. In some subjects the drug was not so well borne, the patients after a few days complaining of gastric uneasiness or a little diarrhea. When such symptoms developed, the administration of the capsules was interrupted. We have administered about 1,000 capsules of arsenobenzol and have never observed any harm to result therefrom.

Limitations of, and Indications for, the Use of Arsenobenzol (Salvarsan) by Mouth.—We wish emphatically to disclaim any intention of advocating the use of salvarsan by mouth as a substitute for intravenous or intramuscular administration. Where these avenues of introduction of the drug into the system can be employed they are far superior to oral ingestion. Syphilis should be treated with as massive doses of spirocheticides as can be given with complete safety to the patient. It is conceivable that the long-continued use of very small doses of salvarsan or mercury may produce a strain of parasites resistant to these drugs. It is not always possible, however, to administer salvarsan by intravenous or intramuscular injection. There are patients whose veins are inaccessible by reason of excessive adiposity; there are other patients whose veins have become thrombosed by repeated

TABLE 2.—INFLUENCE OF SINGLE AND REPEATED DOSES OF ARSENOBENZOL ADMINISTERED IN SOLUTION BY STOMACH TUBE ON EXPERIMENTAL TRYPANOSOMIASIS*

No.	Wt., Gm.	Dose per 100 Gm.	Results of Examination of Blood from Tail														
			1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.	8 da.	9 da.	10 da.	11 da.	12 da.	13 da.	14 da.	15 da.	16 da.
1	56	0.008	—	—	—	—	—	—	+	++++	D							
2†	72	0.008	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3†	140	0.016	—	—	—	—	—	—	—	—	—	few	+	++++	++++	—	D	
4	77	0.020	—	—	—	—	—	—	+	++++	++++	++++	++++	++++	D			
5†	100	0.020	—	—	—	—	—	—	—	—	+	+++	—	—	+++	++++	D	
6†	107	0.020	—	—	—	—	—	—	—	—	+	++	—	—	+	++	++++	++++
7	52	0.032	—	—	few				D									
8	56	0.032	—	—	few					D								
9	82	0.032	—	D§														
10	70	0.032	—	few	—				D									
11	72	0.032	—	—	—			D										
12	48	Control	—	—			D											
13	42	Control	—	—		D												
14	70	Control					D											
15	48	Control	few				D											

* Rats infected with 181,000 T. equiperdum twenty-four hours before the administration of arsenobenzol.
† Nos. 2, 3, 5 and 6 received the same size dose again on ninth and twelfth days.
‡ This animal died sterile on the twenty-third day.
§ Accidental.

injections. In other cases for one reason or another the intravenous route cannot be employed. Many patients object to intramuscular injections on account of the degree of pain induced. In such cases salvarsan may be administered in capsule form, for a period of from two to six weeks, after which its use should be interrupted for several weeks; its employment may be later resumed.

Another indication for the use of salvarsan capsules is as a supplementary treatment to intravenous administration. While the injection of the drug into the blood stream constitutes the most vigorous method of attacking the parasites of syphilis, it has the disadvantage that most of the drug is eliminated in a few days. A powerful impression is made, but an opportunity is given for the spirochetes that have not been destroyed to slowly proliferate again. If after a period of three days following an intravenous injection the capsules are administered, a continuous source of the drug may again be supplied to the blood. Our experiments in the treatment of experimental trypanosomiasis in animals demonstrate conclusively that absorption of the drug in the gastro-intestinal tract leads to a distinct influence on the parasites in the blood. Mercury has for many years been administered in pill form in fractional doses. While there can be no doubt that this is the feeblest method of administering the drug, we are not among those who would affirm that this method of treatment has no virtue. There are doubtless many thousands of persons who have been cured by mercury pills, although a much larger number has remained uncured.

If it becomes necessary for social reasons to administer for a time a drug by mouth in the treatment of syphilis, we would prefer salvarsan to mercury, first, because it is a more powerful spirocheticide, and second, because it has a more tonic and roborant influence than mercury. The cost of the drug might readily be a deterrent factor in prescribing salvarsan by mouth, as much larger doses are required to produce the same effect, in comparison with more efficient routes of administration. This method of treatment is to be reserved for special conditions and for particular cases.

It must be recognized that experimental trypanosomiasis is a more difficult disease to influence than syphilis. With pathogenic trypanosomes, such as the *T. equiperdum*, the parasites appear in the blood within one to two days after intraperitoneal infection. The number of parasites increases with tremendous rapidity and death results within five to seven days. At the time of death there are more trypanosomes in the blood stream than there are red blood corpuscles. We are dealing, therefore, with an acute, virulent, death-producing infection which overwhelms the animal within a week. Syphilis is essentially a chronic infection and its lesions are favorably influenced by much weaker parasiticides than experimental trypanosomiasis. Mercury, in the largest dose that it is possible to administer intravenously, has no demonstrable effect on trypanosomes in the blood. Salvarsan, on the other hand, kills these parasites readily. Salvarsan has a strong trypanotropic influence and a low affinity for the body cells. Rats tolerate arsenobenzol intravenously in the dose of 100 mg. per kilogram. According to our experiments with mercury, this drug is tolerated intravenously in the dose of 2 mg. per kilogram.

Mercury is therefore about fifty times as poisonous as arsenobenzol (salvarsan). Consequently, not sufficient mercury can be given to destroy trypanosomes; the host is killed before the parasites.

TABLE 3.—INFLUENCE OF ARSENOBENZOL ADMINISTERED IN SALOL AND SILVER COATED PILLS ON EXPERIMENTAL TRYPANOSOMIASIS *

Number	Weight, Gm.	Dose per 100 Gm.	Results of Examination of Blood from Tail											
			1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.	8 da.	9 da.	10 da.	11 da.	12 da.
1	82	0.005	—	—	—	D								
2	85	0.005	—	few	++	+++	++++	D						
3	72	0.005	—	few	++	D								
4	85	0.005	—	—	—	—	—	—	—	few	+	++	++++	D
5	75	0.005	—	few	++	++++	D							
6	60	0.005	—	—	—	few	++	++++	++++	D				
7	76	Control	—	few	++++	++++	++++	D						
8	55	Control	—	few	++++	++++	D							
9	70	Control	—	—	++++	++++	D							
10	65	Control	—	few	++++	++++	D							

* Rats infected with 80,000 T. equiperdum three hours before the administration of pills of arsenobenzol.

TABLE 4.—INFLUENCE OF ARSENOBENZOL ADMINISTERED IN CAPSULES ON EXPERIMENTAL TRYPANOSOMIASIS *

Number	Weight, Gm.	Dose,† Gm.	Results of Examination of Blood from Tail												
			1 da.	2 da.	3 da.	4 da.	5 da.	6 da.	7 da.	8 da.	9 da.	10 da.	11 da.	12 da.	13 da.	14 da.
1	140	0.005	—	—	—	—	—	—	few	++++	++++	++++	D			
2	210	0.005	—	—	—	—	—	few	+++	++++	++++	D				
3	140	0.005	—	—	—	—	—		few	++++	++++	D				
4	204	0.005	—	—	—	—	—	—	few	++++	+++	++++	D			
5	202	0.005	—	—	—	—	—	—	few	++++	D					
6	152	0.005	—	—	—	—	—	few	—	+++	+++	++++	D			
7	157	0.005	D‡													
8	206	0.005	—	—	—	—	—	—	—	few	+	++++	D			
9	163	0.005	—	—	—	—	—	—	—	few	+	++++	++++	++++	++++	D
10	194	0.005	—	—	—	—	—	few	++	++++	D					
11	164	Control	—	++	++++	++++	++++	D								
12	170	Control	few	+	++++	++++	++++	D								
13	194	.....	—	—	few	+	+	++	++++	D						
14	209	Control	—	++	++++	++++	++++	D								

* Rats infected with 140,000 T. equiperdum.
† Arsenobenzol administered twenty-four hours after infection (single dose).
‡ Accidental.

Comparison of Modes of Administration.—It may be of interest to compare briefly the effect on trypanosomes in the blood of arsenobenzol (salvarsan), administered by mouth and administered intravenously. We have no means of knowing how much of the drug given by mouth is actually absorbed, but that a considerable portion thereof reaches the circulation is evidenced by the destructive effect on the trypanosomes in the blood stream.

In numerous experiments carried out by us we have found that it requires about 15 to 20 mg. of arsenobenzol (salvarsan) per kilogram of body weight to sterilize a rat infected with *T. equiperdum*. Eight mg. per kilogram will keep the blood free of parasites for eight or nine days, and 11 mg. per kilogram for about three weeks.

Arsenobenzol administered in solution by stomach tube required 90 mg. per kilogram to keep the blood sterile for from ten to fourteen days. It requires, therefore, nine to ten times more of the drug in solution by mouth to produce the degree of sterilizing effect secured by intravenous administration.

Alimentary administration in capsules gives a more favorable comparison. In capsule form 25 to 30 mg. per kilogram renders the blood free of parasites for from five to six days. For some reason, perhaps because the drug remains longer in the upper intestine, capsules appear to give better results than the drug in solution. A single capsule containing 25 to 30 mg. per kilogram appears to have the same sterilizing effect as 12 mg. per kilogram of neosalvarsan administered intravenously. This dose of neosalvarsan keeps the animal sterile for from five to six days.

Effect of Continuous Administration of Arsenobenzol (Salvarsan) in Rabbits.—Arsenobenzol was administered to rabbits once a day by mouth in pills containing .01 gm. each, the pills being coated with salol and silver. This would be the equivalent of 0.3 gm., or 5 grains, for a person weighing 120 pounds.

Rabbit 78, weight 1,928 gm., received twenty-nine doses of 0.01 gm. each of arsenobenzol, or a total of 0.29 gm. over a period of thirty days (equivalent to about 8.7 gm. per 60 kilograms). After the tenth dose there was a loss in weight, and at the completion of the experiment the animal weighed 1,540 gm., or a loss of 388 gm. At no time were albumin and casts found in the urine. The rabbit was later killed and the important organs subjected to microscopic study. No gross inflammatory changes were noted in the stomach or intestines.

Rabbit 79, weight 2,340 gm., received thirty-one doses of 0.01 gm. each of arsenobenzol, or a total of 0.31 gm. over a period of thirty-one days (equivalent to about 9 gm. per 60 kilograms). On the sixth and eighteenth days traces of albumin were found in the urine, but no casts. At the completion of the experiment the urine was free of albumin. The animal lost about 100 gm. in weight, but otherwise appeared to be in a normal condition. It was later killed for histologic study of the important organs. The results of these studies will be published later.

In 1912 we administered to dogs salvarsan in pills and capsules in the dose of from 20 to 30 mg. a day. This would be the equivalent of over a gram a day for a man weighing 120 pounds. The drug was continued for twenty-nine days without any disturbing effects. From our more recent experiments, it is probable that much of the drug administered in pill form was not absorbed.

TABLE 5.—INFLUENCE OF INTRAVENOUS INJECTIONS OF SALVARSAN, ARSENOBENZOL AND NEOSALVARSAN ON EXPERIMENTAL TRYPANOSOMIASIS; RATS INFECTED WITH INTRAPERITONEAL INJECTIONS OF 125,000 TRYPANOSOMA EQUIPERDUM

Substance	Rat No.	Wt., Gm.	Dose per 100 Gm.	Daily Examination of Blood: 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Arsenobenzol Salvarsan	1	88	0.0057	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	2	92	0.0043	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	—	—	—	—
	3	72	0.0042	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	4	76	0.0038	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	++	+++	++
	5	91	0.0011	—	—	—	—	—	—	—	—	—	—	—	—	D										
	6	80	0.0008	—	—	—	—	—	—	—	+	++	+++	+++	+++											
	7	88	0.0058	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	8	72	0.0055	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	9	67	0.0045	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	D		
	10	92	0.0032	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	+	+
	11	73	0.0014	—	—	—	—	—	—	—	—	+	++	++	+++	++++	D									
	12	74	0.0008	—	—	—	—	—	—	—	—															
Neosalvarsan	13	75	0.01	—	—	—	D																			
	14	66	0.009	D																						
	15	58	0.0077	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	16	65	0.0046	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	few	+	+	+++	D
	17	75	0.002	—	—	—	—	—	—	—	D															
	18	72	0.0012	—	—	—	few	few	+	+																
	19	72	0.0009	—	—	—	—	few	+	++++	++++	D														
	20	67	0.0008	—	—	—	—	few	+	++	+++	++++	D													
Control	21	56	0	few	+	++++	++++	++++	+++	D																
	22	51	0	few	+	+++	++++	+++	D																	
	23	51	0	few	++	++++	++++	++++	++++	D																
	24	52	0	few	++	++	++++	++++	D																	

CONCLUSIONS

1. Experiments on animals have demonstrated that arsenobenzol (salvarsan) can be administered by mouth in solution or in capsules and become absorbed into the blood.

2. The proof that absorption takes place is evidenced by the fact that a distinct destructive influence on trypanosomes in the blood of experimentally infected animals is exerted.

3. In a general way it may be stated that about one ninth or one tenth of the dose required in solution by mouth produces an equivalent effect intravenously.

Arsenobenzol (salvarsan) by mouth[2] in capsules exerts, however, about 40 to 50 per cent. of the trypanocidal effect produced by neosalvarsan intravenously.

2. In capsule form, however, the therapeutic effect is distinctly better than when administered in solution by mouth.

4. Experimental studies on animals demonstrate that arsenobenzol (salvarsan) can be administered in capsule form over long periods of time without harmful results.

5. Clinically it has been found that the drug may be given in doses of 30 mg. (½ grain) three times a day for many weeks without producing disturbing symptoms except mild digestive distress, and this is only in a relatively small proportion of cases.

6. Administered by mouth, arsenobenzol (salvarsan) is capable of producing a curative influence on the lesions of syphilis. The effect, however, is much less vigorous than when the drug is administered intravenously.

7. We do not advise the use of arsenobenzol (salvarsan) by mouth as a routine, inasmuch as there are much more efficient avenues of administration. Its use is to be reserved for patients who for some reason cannot take the drug by intravenous infusion or intramuscular injection.

THE GEOGRAPHIC DISTRIBUTION OF AMEBIASIS *

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"Tropical dysentery" of amebic origin has for years been known as a troublesome disease in our Southern states. That it is not uncommon in regions with colder climates is not so well recognized, although sporadic cases have been reported in all parts of the world. To be sure, the disease is more severe, and more frequent in the tropics, and in subtropical climates, but a collection of cases reported in the north temperate zone leads us to state that amebiasis is a surprisingly widespread infection.

The classical report of Lösch[1] (1875) recorded the case of a patient with amebic dysentery at St. Petersburg, Russia. In England, Saundby and Miller[2] reported a case in the Birmingham district. The patient, who had never been away from that particular region, had ulcerative colitis, and a liver abscess in which amebas were found. Saundby and Miller believe that theirs is the first case reported in which the patient contracted the disease spontaneously in England, and are inclined to think that the organisms are being brought to the British Isles by soldiers from the tropics. They call attention in their paper to the report by Juergens in regard to the occurrence of the disease in Berlin, and also to the fact that Caussade and Joltrain recorded one case from Paris, and Kartulis (1906) stated that Scandinavia, Great Britain, Spain and Portugal were the only European countries from which amebic dysentery had not been reported. Low,[3] among others, has recently reported many patients coming to London from Gallipoli. In the Paris letter[4] to THE JOURNAL, dated March 24, 1914, it is stated that:

> Dean Landouzy of the Faculté de médecine de Paris drew the attention of the Académie de médecine to the importation into Europe, especially France, of amebic dysentery by carriers. He reported the case of a patient who died of a large abscess of the liver due to amebic dysentery which was unrecognized, partly because the symptoms were obscure, and partly because the patient had never left the north of France. This patient, therefore, had been infected in France in some as yet unknown manner. Other cases of the same kind have already been reported in France in the last ten years, and there is no doubt that amebic dysentery is being imported into the country.

Albu[5] reported true amebic dysentery in a young German woman after a trip to Silesia and Breslau.

On our own continent many interesting reports have been made of cases in temperate climates. In 1902, Dock[6] reported typical amebic dysentery in a patient who had never been out of the state of Michigan or in contact with a case from the South. In the discussion of this paper, Walsh reported two patients seen in New York City, and Libman, ten cases of amebic liver abscess at Mount Sinai Hospital. None of these patients had resided outside of New York City.

The disease is rather common in Maryland, which, of course, is in the zone in which it is commonly believed to occur. However, in discussing the cases of the previous fourteen years, which were observed in Johns Hopkins Hospital, Futcher[7] says "'Tropical dysentery' is a misnomer. Amebic dysentery is not confined to the tropics, but often originates in the subtropical, even in the higher zones. Sporadic cases occur in New England."

The next year Tuttle[8] called attention to the fact that it should not be called a "tropical disease," and reported three patients who had never been more than 50 miles south of New York, and fifteen patients who had always resided north of 37 degrees of latitude.

Patterson,[9] in 1910, reported a case endemic in New York, and stated that he had had three others. He also reported fifteen from the literature. "A study of these cases does much to disabuse one of the idea that amebic dysentery is exclusively a tropical disease."

One of the most interesting reports is that of Axtell.[10] He had a patient who had been a mate on a government boat on the Tanana and Yukon rivers, Alaska. This man supposedly contracted amebic dysentery by drinking swamp water in the spring. "*Ameba coli*" was found, and amebic ulcerations were seen with the proctoscope. The man claimed that he knew of thirteen or fourteen others with the same trouble.

A large group of cases was reported by Rosenberger.[11] Examinations were made of the stools of the patients in a hospital for the insane in Philadelphia. Of 137 males, 112 had amebas, and of 141 females, eighty-six showed the parasites. The author calls them all "*Ameba coli*," and says that the patients were constipated and not dysenteric.

It is scarcely necessary to quote other reports of sporadic cases in order to add weight to the statement

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* From the Mayo Clinic.

* Read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. Lösch, F.: Massenhafte Entwickelung von Amöben im Dickdarm, Virchows Arch. f. path. Anat., 1875, lxv, 196.
2. Saundby, R., and Miller, J.: Amoebic Dysentery with Abscess of the Liver, Brit. Med. Jour., 1909, i, 771.
3. Low, G. C.: The Treatment of Amoebic Dysentery, Brit. Med. Jour., 1915, ii, 714.
4. Paris letter, THE JOURNAL A. M. A., April 18, 1914, p. 1267.
5. Albu, A.: Zur Kenntniss der sporadischen einheimischen Dysenteria, Ztschr. f. klin. Med., 1905, lvi, 432.
6. Dock, George: Amebic Dysentery in Michigan, THE JOURNAL A. M. A., Sept. 13, 1902, p. 617.
7. Futcher, T. B.: A Study of the Cases of Amebic Dysentery Occurring at the Johns Hopkins Hospital, THE JOURNAL A. M. A., Aug. 22, 1903, p. 480.
8. Tuttle, J. P.: Amebic Dysentery: Its Local Lesions and Treatment, THE JOURNAL A. M. A., Oct. 8, 1904, p. 1022.
9. Patterson, H. S.: Amebic Dysentery in New York, Med. Rec., New York, 1910, lxxvii, 835.
10. Axtell, W. H.: Amebic Dysentery Contracted in the Arctics of Alaska: Report of a Case, Northwest Med., 1911, N. S. iii, 51.
11. Rosenberger, R. C., and Terrell, T. C.: Amebiasis and the Results of Tests for the Determination of Occult Blood in the Feces, New York Med. Jour., 1913, xcvii, 62.

that persons with this disease are not so uncommon in the Northern states.

For several years at the Mayo Clinic the stools of patients with chronic diarrhea have been systematically examined. Sistrunk,[12] Giffin[13] and I[14] have all made reports of these findings. During the past five years there have been approximately 6,500 stool examinations. Repeated examinations, and examinations for occult blood, etc., reduce the number of patients examined for parasites to about 5,000. The same method has been used for all of these patients. One-half ounce to an ounce of Epsom salt is taken before breakfast. The patient eats his breakfast and comes to the laboratory for the passage of his stool. This is examined at once. A cover slip preparation is made and the slide kept at body temperature by means of a warm stage. It should be mentioned that after the administration of castor oil, stools are unsatisfactory for microscopic examination.

In classifying the amebas found in fresh specimens, we have followed Craig's[15] descriptions, noting especially the appearance of the ectoplasm, the nucleus, its position, etc., the motility and the pseudopodia, whether there is mere bulging of the ectoplasm, or lobose, and finger-like prolongations, and especially whether the organisms are ingesting and digesting red blood cells. The color, which at times is noticeably green in some organisms, is thought by some observers to be due to digestion of red blood cells.

In some instances we have stained specimens with iron hematoxylin, following in detail both in the preparation and in the study of the specimens the valuable monographs of James[16] and of Craig.[15] By this method we are able to examine especially the nuclear structures. In *Endamoeba histolytica* the beaded arrangement of chromatin around the outer portion of the nucleus, the reticulated nucleoplasm, and the sharp karyosome surrounded by a clear zone are all characteristic. In the nonpathogenic ameba, *Endamoeba coli*, the chromatin is seen as a heavily staining mass, forming the karyosome, and as a dense ring about the outer portion of the nucleus.

We have not been able to study as fully as we should like the various phases in the processes of reproduction of these organisms. Rather frequently, however, we see cysts with only four daughter cells — the *tetragena*, or *histolytica* cyst, and again those of *Endamoeba coli* with eight nuclear bodies. Many protozoologists claim that an absolute diagnosis can be made only by studying cysts. We have recognized fully the difficulties in attempting to classify types of amebas, and feel that in some instances errors in diagnosis readily occur.

There have been 284 patients from Northern states in whom we have reported *Endamoeba coli*, the supposedly nonpathogenic organism, and 535 patients from the same sections of the country who were infected with organisms classified as *Endamoeba histolytica*.[17] In all, there were 819 persons in whose stools we found some type of ameba. The majority of these patients were natives of the state in which they resided, and all of them became infected while living in the northern portions of the temperate zone.

CASES OF AMEBIASIS

	Northern States and Canada																														Total Number of Patients, 1911-1916	Southern States and Tropics
	Minnesota		Iowa	South Dakota	North Dakota	Wisconsin	Illinois	Michigan	Indiana	Ohio	Kansas	Nebraska	Wyoming	Colorado	Montana	Idaho	Utah	Oregon	Washington	New York	Pennsylvania	Massachusetts	New Hampshire	Maine	Saskatchewan	Manitoba	Alberta	Ontario	Totals from North		
Constant diarrhea:																																
Endamoeba histolytica	51		41	30	25	16	8	6	1	2	1	9	1	1	8	1	1	1	2	1	1	0	1	8	5	3	1	224	20	
Endamoeba coli		34	10	8	5	3	1	0	1	1	1	2	1	0	3	1	1	0	0	1	1	0	0	0	1	0	0	75	4	
Intermittent diarrhea:																																
Endamoeba histolytica	38		42	22	8	11	7	4	4	3	3	4	1	1	12	6	1	1	3	0	1	0	0	6	3	2	2	175	20	
Endamoeba coli		33	15	9	4	6	2	1	3	0	2	3	0	0	4	1	0	1	0	0	1	0	1	0	2	2	1	0	92	12	
Constipation:																																
Endamoeba histolytica	44		20	5	10	8	9	1	2	1	0	4	0	0	7	3	1	0	0	1	1	0	0	0	2	2	3	1	0	136	25	
Endamoeba coli		29	27	15	12	4	8	4	0	1	2	3	2	1	7	3	0	0	0	0	1	0	0	0	2	2	2	1	0	117	14	
Total Endamoeba histolytica	133		113	58	43	35	24	11	7	4	4	16	2	2	27	10	2	1	1	6	3	1	1	8	5	3	1	535	65	69
Total Endamoeba coli	106		52	32	21	13	11	5	4	2	5	9	3	1	10	4	1	1	1	0	2	1	0	0	4	5	2	0	284	30	31
Total amebas	229		165	90	64	48	35	16	11	6	9	25	5	3	37	14	2	2	2	6	5	1	1	8	9	5	3	819	95	91

It is also not conceivable that many, if any, of these patients could have contracted the disease by contact with persons from the South or tropics. A consideration of the number of patients with amebas from the various states is of interest (table and map). Besides the northern cases, we have as "controls" ninety-five patients from the South or the Orient in whom we have found amebas. Sixty-five of these have *Endamoeba histolytica*, and thirty, *Endamoeba coli*, so that in all the 5,000 patients examined for parasites, amebas of some sort were found in 18 per cent. It should be remembered, however, that the number having stool examinations was less than 5 per cent. of the total number of patients registered at the clinic during these five years.

Another false idea may be formed by comparing the great number of patients with amebas residing in Minnesota and Iowa with the relatively small number in the Far Western or Eastern states. As a matter of fact, the relative number of these patients is not great, as more than three tenths of the registration at the

12. Sistrunk, W. E.: Intestinal Parasites Found in Individuals Residing in the Northwest, The Journal A. M. A., Nov. 4, 1911, p. 1507.
13. Giffin, H. Z.: Clinical Notes on Patients from the Middle Northwest Infected with Entamebas, The Journal A. M. A., Aug. 30, 1913, p. 675.
14. Sanford, A. H.: Intestinal Parasites of Minnesota, Journal-Lancet, 1914, xxxiv, 335.
15. Craig, C. F.: The Parasitic Amoebae of Man, Philadelphia, J. B. Lippincott Company, 1911.
16. James, W. M.: A Study of the Entamoebae of Man in the Panama Canal Zone, Am. Trop. Med. and Parasitol., 1914, viii, 133.
17. All organisms formerly reported as Endameba tetragena are now grouped with Endameba histolytica. (Craig, C. F.: The Differential Diagnosis of the Intestinal Entamebas of Man, Arch. Int. Med., June, 1914, p. 917. Darling, S. T.: Budding and Other Forms in Trophozoites of Entamoeba Tetragena, Arch. Int. Med., May, 1913, p. 495).

Mayo Clinic is of Minnesota patients, and nearly two tenths are patients from Iowa.

When the complaints of these persons are considered, interesting facts are brought forth regarding symptoms in patients infected with amebas in temperate climates. Forty-one per cent. have constant diarrhea, and 33 per cent. have intermittent diarrhea, often alternating with periods of constipation; while nearly 26 per cent. have never had any bowel trouble except constipation. Occasionally these patients have ulcerations that are seen with the proctoscope, but the majority of examinations of this sort are negative. In fact, the entire syndrome is not so severe in the average ameba-infected patient of the North as it is in those of the South or tropics.

The question arises as to the significance of pathogenic amebas in the stools of patients who have never had diarrhea. It would certainly seem that these patients were not in need of immediate treatment. However, it must be remembered that in the South and tropics liver abscesses of amebic origin may occur in just this type of patient. Jones[18] has said that "amebiasis may exist in a mild form or even advanced form without dysentery." He reports five cases of amebic abscess, in four of which no history of dysentery was given.

In a recent editorial[19] is found the following statement:

> The recognized existence of unharmed or immune carriers of other types of organisms makes it seem less strange today than it might have seemed a few years ago to learn that there are some individuals apparently perfectly healthy who harbor amebas in large numbers for long periods without any unfavorable symptoms.

These carriers may be a source of danger to others, and in themselves may be considered potential dysentery patients. Regarding treatment of such patients, Phillips[20] has said, "All carriers, even though they may have never had dysenteric or other symptoms, are to be considered as cases of amebiasis and treated as such." Many of our patients of this kind, as well as those with active symptoms, have been treated with emetin hypodermically, ipecac by mouth, and kerosene enemas.[21]

We are often asked for an explanation of the source of the infection. The soldier returning from the tropics surely cannot be held entirely responsible for the spread of the disease, as the majority of our patients have come from rural communities and have never come in contact with persons with tropical infections.

Patients developing amebiasis in Northern United States and Canada examined at the Mayo Clinic, 1911-1916: O, Endamoeba histolytica; +, Endamoeba coli.

We have considered the question of water supply in our series of more than 900 patients with endamebas, including those from the South and the Orient. Forty per cent. stated that their water supply was from a source that might be suspected, namely, shallow wells, lakes, springs, cisterns, reservoirs, streams, and in a few instances, even ditches. On the other hand, 60 per cent. of the patients harboring these parasites affirmed that the source of their water supply was good — deep wells, many of them of the artesian type.

18. Jones, G. I.: The Treatment of Intestinal Amebiasis, THE JOURNAL A. M. A., March 20, 1915, p. 982.
19. Craigiasis, editorial, THE JOURNAL A. M. A., Nov. 6, 1915, p. 1648.
20. Phillips, L.: Is Emetin Sufficient to Bring About a Radical Cure in Amoebiasis? Brit. Med. Jour., 1914, ii, 1061.
21. A more detailed study of symptomatology and the effects of treatment of amebiasis in Northern patients is to be undertaken at another time.

It has been suggested that fruits and green vegetables, shipped from the South and handled there by carriers of amebas, may be the means of spreading the disease northward. But here again we cannot imagine that the Northern farmer will indulge frequently his desire for out-of-season strawberries and lettuce when he himself may raise them for market. It is known that some of the domestic animals, horses, for instance, may be infected with amebas, and Lynch[22] has shown that the rat, *Mus norvegicus*, suffers from spontaneous amebic dysentery similar to that occurring in man, the amebas in its stools resembling *Endamoeba histolytica*. Furthermore, Lynch has proved definitely that typical dysentery can be produced experimentally in the rat with amebas from man. In conclusion, he states that the rat is a possible or probable disseminator of dysenteric amebas pathogenic for man.

We have undertaken the transmission of amebas from man to animals in a few instances. When old cats were used we did not meet with success. However, in a small series we have infected kittens, using the technic of Sellards and Baetjer[23] for intracecal injections. These animals developed dysentery in from six to ten days, with amebas in their stools.

It is not in the province of this paper to discuss the question of specific pathogenicity of amebas. It is agreed now that the parasitic types have never been cultivated even in mixed culture with bacteria. Accordingly, the first of Koch's postulates has not as yet been met. The question as to whether symbiosis plays a part in the disease is pertinent and difficult to answer. There are many problems yet to be solved in connection with this subject, and there is a field for study in the North as well as the tropics.

In conclusion, I would reiterate that it should be realized that this infection is general and that stool examinations are worth while for any patient with vague abdominal complaints or chronic diarrhea, no matter whence he comes.

22. Lynch, K. M.: The Rat a Carrier of a Dysenteric Ameba, THE JOURNAL A. M. A., Dec. 25, 1915, p. 2232.

23. Baetjer, W. A., and Sellards, A. W.: Continuous Propagation of Amoebic Dysentery in Animals, Johns Hopkins Hosp. Bull., 1914, xxv, 165.

THE AMOUNT OF FAT IN THE BLOOD STREAM OF PERSONS WITH BROKEN BONES

A PRELIMINARY REPORT *

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Warthin[1] says:

It is highly probable that in every case of amputation or fracture of the long bones some fat is set free from the ruptured fat cells and, either directly or by way of the lymphatics, enters the blood stream to cause fat embolism of the pulmonary capillaries, or, passing the lungs, in the capillaries of some other organ. . . . The amount of free fat liberated into the blood stream is often almost incredible, single sections of the various organs and tissues of the body showing, on microscopic examination, such numerous emboli that it would seem that the total amount of fat contained in the emboli must far exceed the fat content of the injured bone. In some of these cases when the entire circulatory system is apparently flooded with fat, the injury to the bone and bone marrow may apparently be very slight, although in severe cases one or more comminuted fractures are usually present.

Le Count and Gauss[2] made a microscopic study of the amounts of fat in tissues of persons dying with broken bones as compared with the amounts found in tissues from the body of a man dying of fat embolism, following fracture of both bones of a leg, who clinically had well pronounced symptoms of fat embolism. They found a remarkable dissemination of fat emboli in microscopic preparations of lung, heart muscle, kidney and liver from all of thirteen persons dying with broken bones, and also fat emboli in four brains examined microscopically. They say:

We obtained no evidence that the amount of fat in the blood vessels at the time of death demonstrable by such methods as we employed was in any way proportionate to the severity of the symptoms; on the contrary, the evidence at hand indicates that the amount of fat in the blood as emboli in persons with fractured bones varies from time to time.

TABLE 1.—PERCENTAGE OF FAT RECOVERED FROM THE BLOOD ON DISCHARGE: ESTIMATIONS BY KUMAGAWA-SUTO METHOD OF THE FAT IN THE BLOOD OF PATIENTS ABOUT TO BE DISCHARGED—CONTROLS *

Conditions for Which Patients Were Treated Before Discharge as "Cured"				
Chronic Nephritis (12 Examinations, 12 Patients)	Lobar Pneumonia (9 Examinations, 9 Patients)	Acute Articular Rheumatism (5 Examinations, 5 Patients)	Chronic Arthritis (4 Examinations, 4 Patients)	Secondary Syphilis (1 Examination, 1 Patient)
0.24	0.38	0.19	0.4	0.31
0.31	0.4	0.38	0.43	
0.31	0.41	0.43	0.48	
0.33	0.45	0.52	0.56	
0.4	0.46	0.53		
0.4	0.47			
0.44	0.58			
0.48	0.58			
0.49	0.61			
0.56				
0.56				
0.56				
0.59				

* Thirty-one estimations, giving an average normal of 0.442.

Le Count and Gauss also emphasize the haphazard and loose way in which the conclusion is frequently arrived at that patients with fractured bones suffer and die from delirium tremens.

My work, an effort to obtain some idea of the amount of fat in the blood of persons with fractured bones, is also in some measure a protest against the diagnosis of delirium tremens under these conditions without due consideration of the possibility that fat embolism may play some rôle in causing the delirium.

In the quantitative determinations of the amounts of fat in the blood streams of persons with broken bones, I have employed the Kumagawa-Suto[3] saponification technic. On account of its rather elaborate details it will not be described here. References to it are quite generally accessible. I first made control tests with subcutaneous fat from the human abdominal wall.

Such fat was heated in a water bath, and the resultant oil in weighed amounts varying from 0.0462 to 2.1 gm. (in all, five portions), were taken and emulsions made in 20 c.c. of normal saline solution. These emulsions were saponified and extracted of fat as in the Kumagawa-Suto method, and in all instances the percentage of error was less than 0.1. While this error was relatively large, its constancy seemed to warrant

* From the Pathology Laboratory of Cook County Hospital.

1. Warthin, A.: Traumatic Lipemia and Fatty Embolism, Internat. Clin., 1913, iv, 171.

2. Le Count, E. R., and Gauss, H.: A Study of Fat Embolism Associated with Fractures, Tr. Chicago Path. Soc., 1915, ix, 251.

3. Kumagawa, M., and Suto, K.: Ztschr. f. Biochem., 1908, viii, 212.

application of the method in samples of blood with relatively high fat content at least.

Accordingly, blood was taken from the arm veins of persons being discharged from the Cook County Hospital as "cured" from various maladies other than injuries or operations. In all, thirty-one such samples of approximately 20 c.c. each were examined. The patients from whom this blood was taken could not be considered "normal" individuals, as many had but recently recovered from the febrile state of acute infections and, in a measure perhaps, were "starved." In Table 1, these control estimates are given, and it is noticeable that the average percentage of fat in the blood is a little above that usually regarded as normal.

In Table 2 the pertinent clinical observations concerning the diagnosis of fat embolism associated with broken bones are arranged together with the percentages of fat recovered from the blood. One patient and her injuries, as well as the other circumstances, possess more than usual interest. She had suffered for several months from an ununited fracture of the shaft of the femur. Twenty-four hours previous to the time of taking blood for fat estimation, under ether anesthesia for eighty-five minutes, a large medullary bone peg was driven into the freshened broken ends of the femur. Whether anesthesia or nonunion had in any measure anything to do with the large amount of fat in the blood is not a part of this consideration. Similarly the seemingly incredible amount of fat recovered from the blood in Cases 2, 4, 6 and 7 form a problem for consideration not in the scope of this report.

The fat determinations expressed in Cases 6 and 7 were made on blood removed from dead bodies by allowing blood to run into a grease-free container from surfaces made by cutting the lungs. Examinations for fat from these two bodies offer additional evidence of the usefulness of the method, for in each instance the blood was divided into fractions after

TABLE 2.—SOME OF THE ESSENTIAL SYMPTOMS AND THE AMOUNTS OF FAT CONTAINED IN 20 C.C. OF BLOOD

Case Number	Sex and Age	Bone Fractured	Hour After Fracture	Delirium	Tremor	Respiration*	Cyanosis	Sputum†	Temperature	Pulse	Recovery or Death	Percentage of Fat in the Blood
1	F. 26	Femur.....	24	+	++	Dys.	—	+	101	96	R	6.5
2	F. 28	Femur.....	48	++	+	Dys.	++	—	104	140	D	4.2
3	F. 58	Femur.....	48	—	+	Dys.	+	—	103	100	R	0.8
4	F. 57	Tib., fib. ...	40	+	—	Dys.	+	—	98	98	R	4.0
5	M. 18	Femur.....	100	++	+	Dys.	++	+	101.6	120	D	2.1
6	M. 43	Rad., ulna, skull.....	P.M.	Coma	—	Dys.	—	?	106.8	150	D	3.4
7	M.	Skull.....	P.M.	++	++	Dys.	?	?	101	76	D	3.0
8	M. 29	Fibula.....	240	—	—	Dys.	—	?	98	110	R	0.4
9	M. 50	Humerus...	140	—	—	Dys.	—	?	98	100	R	0.2
10	M. 18	Skull.....	48	—	—	Dys.	—	?	100	80	R	0.7

* "Dys." for dyspnea.
† "Sputum +" for fat droplets in the sputum.

thoroughly shaking, each fraction being subjected to fat determination separately. Thus in Case 6, four fractions of the well shaken blood were saponified separately, and the percentage of fat for each determined. The highest percentage found was 3.75, and the lowest 3.0, while the 3.4 per cent. in the table expresses the average.

Several hours after removal from the dead body, blood from these lungs (Cases 6 and 7) contained so much fat that it separated out in droplets on the sides of the bottles, and in microscopic preparations from the upper layers of this sedimented blood an almost incredible amount of fat was present.

It is with knowledge of the criticism of the Kumagawa-Suto method offered by Rosenthal and Trowbridge[4] that the results of this work are published. However, with the controls already given it would seem reasonable to conclude that in persons with broken bones there is frequently a remarkable amount of fat in the blood stream, and almost incredible amounts of fat may be in the blood and yet not kill. Further, it might be assumed that the amounts of fat free in the blood stream of persons with broken bones vary from time to time, and it is very essential for any interpretation of these results to remember that in no instance was the whole blood examined; that other similar amounts from the same patients (or dead bodies) might have shown a fat content either greater or less, since the fat is not emulsified but is in motion as free fat droplets, and no doubt these vary from time to time in their number and size as well as in their distribution, the blood in some places perhaps being rich in fat and in others poor or with no fat as emboli.

It is also to be remembered that, with the exception of Cases 6 and 7, the fat determinations were made on blood removed from a vein in the hollow of the elbow, the fat so recovered being fat which had passed through the capillaries of both the pulmonary and systemic blood vessels.

4. Rosenthal, H., and Trowbridge, P. E.: The Estimation of Fat, Jour. Biol. Chem., 1915, xx, 711.

INFECTIOUS ENDOCARDITIS

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During the last few years the conception of the elemental functions of the heart muscle has undergone radical change, and a fuller comprehension of the causes of infections of the heart has resulted from the work of such observers as Poynton and Payne, Billings, Rosenow, Libman, Baehr, Schottmüller and others. The pathologic changes present in the heart in extracardial and cardiac infections have received attention at the hands of a number of writers, and the symptomatology of myocardial changes in heart affections of an inflammatory origin have been extensively elucidated, particularly by Mackenzie. But the pathology of the living heart and its changing symptomatology during the course of an inflammation are not yet thoroughly understood. On an intimate knowledge of the vital pathology of the inflamed heart depends naturally proper conception of treatment of its infections, and it certainly seems that attention to manifestations of the earliest lesions in bacterial endocarditis would many times prevent a simple inflammation from becoming a malignant one, and also that during convalescence from an endocarditis, painstaking attention to the state of repair in myocardial degeneration would result in fewer relapses, less ventricular hypertrophy, and a better ultimate outlook for the patient.

While the nature of the finer changes that the heart cell undergoes under the influence of bacterial toxins is imperfectly understood, changes that are not demonstrable, still observation of a number of cases of infectious endocarditis suggests that an analysis of the known pathology and its correlation with the symp-

toms of deficiency of the several myocardial functions may with profit be undertaken. Various bacteria may cause infectious endocarditis, chief of which is the viridans group, including Poynton's *Diplococcus rheumaticus;* also the pneumococcus, staphylococcus, streptococcus, gonococcus, meningococcus, bacillus of influenza and typhoid and a few others, unnecessary to mention. The severity and degree of the inflammation produced depends on several factors: the state of resistance of the patient, the virulence of the invading organism, the number of the organisms gaining access to the heart, as, for example, a continual infection from chronic tonsillitis or chronic alveolar abscess over an extended period of time. Up to a certain point in the development of an endocarditis, the removal of such a focus may lessen the cardiac inflammation; but when the latter has become well established, the removal of the original focus usually has little influence. In a boy, aged 14 years, an infectious endocarditis resulted from two large boils on the abdomen which were well within a week; but the endocardial inflammation was active for about eight months longer.

Unless the original focus may be discovered, and often this is difficult, the nature of the bacteria involved in cases that terminate favorably remains in doubt, because with the rarest exceptions a positive blood culture means a hopeless prognosis.

Pathologic changes in infectious endocarditis as seen at necropsy do not by any means represent the entire pathologic picture. It has been well said by Mackenzie that inasmuch as the myocardium and pericardium are so often involved in inflammation of the endocardium, the term "carditis" is preferable to endocarditis. Particularly is this true if it be remembered that all of the symptoms present in endocarditis are due to abnormalities of the cardiac functions. In all fevers, particularly in continued fevers and more especially in certain classes of infections, as, for example, typhoid fever, the heart muscle undergoes a demonstrable change due to the action of bacterial poisons. There may be seen edema, cloudy swelling which may go on to fatty degeneration, resulting either in destruction and areas of fibrosis or resolution. Undoubtedly other changes occur which have not been demonstrated microscopically which nevertheless are seen in altered cardiac function. This is particularly true in carditis apparently on account of the proximity of the source of the toxins whereby the cardiac cells are subjected to comparatively much larger doses of the poison than if the inflammation were in some other part of the body. Parenthetically, it has been shown that particularly in rheumatic inflammations there may be found within the muscle small patches of round cell infiltration which may result in areas of sclerosis of varying size and account for the crippling of the heart in later years. Moreover, of importance in the aftermath of endocarditis are the scars left in the myocardium adjacent to the endocardial infection which may involve one or the other of the seats of the elemental functions of the muscle as, for example, the bundle of His. An analysis of abnormal heart functioning entails separate consideration of the special functions; that of the production reception of impulses, conductivity, contractility and tonicity. It appears that from the very beginning of cardiac inflammation until long after the active inflammatory process has disappeared, there is present a hyperexcitability of some of these functions. Why in a given case one function alone may be abnormal is a matter of conjecture; that it is not necessarily due to a focus of inflammation will be pointed out later.

In a girl, aged 7 years, observed on the second day with an acute endocarditis, only the pace-making function of the heart appeared to be involved as exemplified by a tachycardia of 120 beats a minute, regular rhythm and the heart not enlarged, the temperature being about 100 F. The following day the function of tonicity was markedly impaired, the heart being quite dilated and also there being numerous extrasystoles, the result evidently of hypersensibility of the ventricular node. Again, in a man, aged about 32, suffering from a chronic infectious endocarditis with considerable ulceration and numerous metastases and a plentiful growth of *Streptococcus viridans* in the blood culture, there was present on admission a well marked pulsus alternans which disappeared in the course of a few days. Interference of the function of contractility of the heart was again demonstrated in this man at a subsequent period following the operation of tonsillectomy, at which time the alternating pulse reappeared and persisted a number of days. That the interference of these functions is of a toxicant nature and not due to the presence of an inflammatory process in the heart muscle itself is demonstrated by the fact that Mackenzie reports increase of the a-c interval in cases of pneumonia with high fever without heart involvement. He also observes the onset of auricular fibrillation after pneumonic crisis.

After all evidence of inflammation in the heart has disappeared even for a considerable time, this hyperexcitability of the myocardium may readily be demonstrated. A few doses of digitalis in a convalescent patient may produce very readily a digitalis block; a little unusual excitement may cause tachycardia; unaccustomed exertion readily causes failure of tonicity and dilatation with the recurrence of murmurs. It may be assumed that the pathologic condition present, while not necesarily going to the extent of cloudy swelling or fatty degeneration, still probably tends in that direction, and it would appear that this irritability will persist until complete resolution of such myocardial changes has had time to take place.

In the treatment of cardiac inflammation, aside from the matter of complete rest until all possible inflammatory process has ceased, there is the necessity of observing the presence of myocardial excitability, as evidenced by the derangement of one or other of its functions, to the end that a sufficient degree of reserve strength of the heart shall have been attained to meet the strains which the careless patient may impose on it. Careful attention to the effect of massage, passive movements, additional pillows under the patient's head, sitting up in bed, and the first exertion that the patient is allowed to indulge in constitute a guide to the rapidity with which additional activities may be allowed. It is frequently observed that, with the increase of graduated exertions on the part of the patient, temporary dilatation or irregularities occur; and it must rest on the judgment of the physician to determine to what extent, if any, under these conditions, the work of the heart has been excessive, and how soon similar exertion may again be undertaken. It is by carefully increasing the amount of work within the limits indicated by interference with the various functions of the heart that the normal reserve force is gradually built up.

209 Post Street.

TREATMENT OF LOBAR PNEUMONIA WITH AUTOLYZED EXTRACTS OF PNEUMOCOCCI *

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One of us[1] has noted for some years the apparent beneficial effect from the early subcutaneous injection of large doses of partially autolyzed pneumococci in the treatment of lobar pneumonia, and Rosenow and Hektoen[2] have lowered the mortality rate in cases of lobar pneumonia in Cook County Hospital, Chicago, for three consecutive years, by the administration of partially autolyzed pneumococci to alternate patients. This was accomplished in spite of the fact that the average time of the first injection was four and one-half days after the onset, and that the type of cases treated was of the worst, one half of the patients being bad alcoholics.

The results of the individual injections, however, unless the injections were given soon after the initial chill, were, as a rule, not striking, as measured by rapid defervescence of the temperature and amelioration of symptoms. One of us[3] had previously shown that while autolyzed extracts of pneumococci are extremely toxic at a certain stage of autolysis, they lose their toxicity on further autolization. In a former report,[1] it was stated that "intravenous injection of heat-killed pneumococci, of pneumococcus extracts during the toxic stage and after the toxicity has disappeared, of pneumococcus broth-culture filtrates and of autolyzed pneumococci render guinea-pigs resistant to subsequent injections of toxic autolysates in two, four, six, twenty-four and forty-eight hours, respectively. Salt solution, broth, and extracts of typhoid bacilli, on the other hand, do not render guinea-pigs refractory to toxic pneumococcus autolysates. The reaction seems to be specific." It was found also that the protective power against experimental pneumococcus infection was greater with the antigens from which the toxic substance had been removed. We, therefore, felt that the intravenous injection of relatively nontoxic autolyzed extracts might be expected to give equally favorable or more favorable results than the subcutaneous administration of partially autolyzed pneumococci.

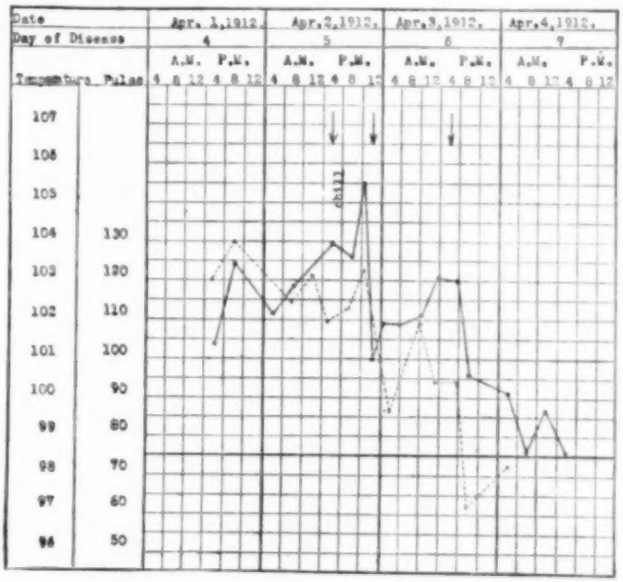

Chart 1.—F. S., a man, laborer; pneumonia of left lower lobe. Solid line, temperature curve; broken line, pulse curve.

April 1, 1912: Pneumonia began four days ago; general condition good. Pulse 108 to 122; respiration 36.

April 2, 5 p. m. Injected intravenously 18 c.c. of Extract 292. Severe chill thirty minutes later lasting ten minutes. Temperature went up to 105.6 and then dropped to 100.8 with profuse sweat by 10 p. m.; 10:30 p. m., injection repeated. Severe chill one hour later lasting twenty-five minutes.

April 3: Appears better. Pulse and respiration down nearly to normal. Not bothered with cough. Injected 10 c.c. intravenously. No chill.

April 4: Has had crisis. Appears much better. No cough or distress.

The clinical problem presented was to produce, if possible, artificial crises, to cause the disease to run a more favorable course, or to reduce the mortality rate. In order to make sure that no harm would come from the introduction of this foreign protein into the blood stream, the effect of the extracts used was tested in guinea-pigs, and very small doses were first used in order that we might become familiar with the nature of the reaction and govern our dosage accordingly. We had in mind particularly the danger of a severe chill and the subsequent shock, which in a weakened person might result in acute dilatation of the heart.

The patients treated were from the medical wards of the Cook County Hospital. There was no selection of cases. During the period of time covering this investigation (March 2, 1912, to May 1, 1912) every patient was injected as soon as the diagnosis of lobar pneumonia could be made clinically. One of us made rounds in all the medical wards of the hospital every day. Practically all the injections were made between the hours of 2 and 5 p. m. In a few cases a second injection was made about six hours after the primary injection, in the hope of prolonging the drop in temperature following the administration of the proper initial dose. The number, time and size of the injections were governed by our endeavors to produce certain effects, and also to a considerable extent by the stage of the disease and the general condition of the patient. Thus, in the first cases treated we used only 5 c.c., and, obtaining practically no reaction, we increased the dose to 10 c.c. Reactions were obtained with this amount, and several injections were made in order that we might study the reactions before increasing the dosage. Finally we used 20 c.c. as a dose in all cases unless there were contraindications, that is, prolonged high temperature, marked valvular or myocardial disease, or a late stage in the course of the disease when the natural crisis was to be expected. In these cases it was thought advisable to use the smaller dose of 10 c.c. The patients were seen every day until completely recovered or until death occurred. Physical examinations were made and notes taken in regard to the change of local and general findings.

When given intravenously, the antigen was injected into the median basilic vein. The skin was sterilized

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1. Rosenow, E. C.: The Autolysis of Pneumococci and the Effect of the Injection of Autolyzed Pneumococci, THE JOURNAL A. M. A., June 11, 1910, p. 1943; Immunization in Pneumococcus Injections, THE JOURNAL A. M. A., Sept. 7, 1912, p. 795. Mechanism of Intoxication in Pneumococcus Anaphylaxis and in Pneumococcus Infections, Tr. 15th Internat. Cong. Hyg. and Demog., 1912, ii, 338.

2. Rosenow, E. C., and Hektoen, L.: Treatment of Pneumonia with Partially Autolyzed Pneumococci, THE JOURNAL A. M. A., Dec. 20, 1913, p. 2203.

3. Rosenow, E. C.: On the Nature of the Toxic Substance from Pneumococci, Jour. Infect. Dis., 1912, xi, 235.

by prolonged rubbing with 95 per cent. alcohol, and the syringe and needle were boiled before each injection. In cases of patients receiving the antigen subcutaneously, the injections were made into the anterior surface of the upper abdomen.

A very conservative attitude as to the effect was adopted by the one giving the injection. Four extracts were used. The toxicity of two (292 and 304) had not yet entirely disappeared, as determined by intravenous injection into guinea-pigs. Injections of from 10 to 20 c.c. into patients were usually followed by a chill. Smaller doses usually failed to produce noticeable reaction. All but four of the patients were injected with these extracts. One of the extracts (301) had lost its toxicity from prolonged autolysis, so that 10 to 20 c.c. failed to produce a chill. One extract was rendered nontoxic by digestion with washed rabbit leukocytes. In only one of four cases injected with the nontoxic extracts was there a drop in temperature and a corresponding improvement in the patient.

A few rather striking facts stand out in a review of the thirty-five patients studied. In the majority there was a typical temperature reaction consisting of a slight rise in a few hours, followed by a marked fall of from 2 to 6 degrees F., which reached its low point about six hours after the injection. A secondary rise was then noted which frequently extended up to the former level; but in most cases the temperature ran along somewhat lower than it was before the injection.

In several instances a second injection was made about six hours after the first injection. The temperature curve at this time was at its lowest point, and it was hoped that a second injection might produce a still further drop or even a permanent crisis. This did not occur, however, and the temperature of most of the patients rose despite the second injection. Charts 1 and 2 illustrate the curves and facts in two cases — one patient with a chill, the other without.

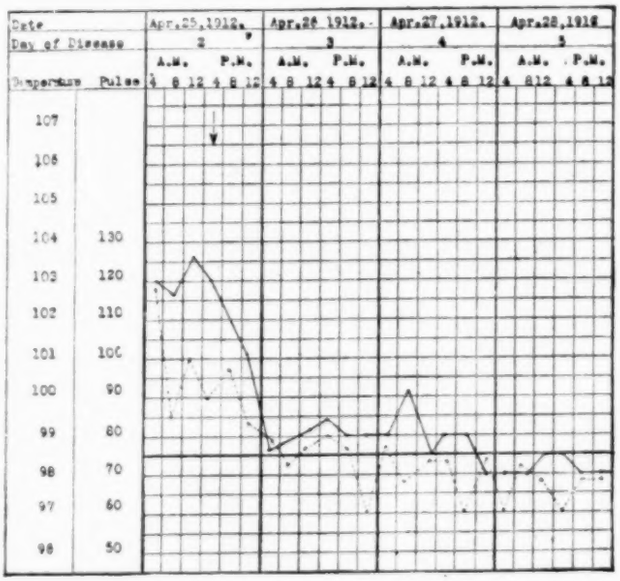

Chart 2.—P. N., male, aged 35, laborer; pneumonia right lower lobe, began two days before (April 23, 1912).
Solid line, temperature curve; broken line, pulse curve.
April 25, 1912: General condition good. Temperature 103, pulse 96, respiration 32, leukocytes 17,400. 20 c.c. Extract 301 injected intravenously. No chill.
April 26: Appears much better. Crisis last night. Leukocytes 15,900.
April 27: Appears normal.

A chill was noted in twelve cases. It came on usually from ten to twenty-five minutes after the injection, and lasted from a few minutes to half an hour or longer. In some instances the reaction was mild; in others it was severe, causing alarming symptoms such as dyspnea, cyanosis and mental disturbances (fear and confusion being most frequently complained of). In a few instances beneficial effects, as measured by lower temperature, pulse and respiration and the general appearance of the patient, were obtained without a chill following the injection. It was hoped that this could be brought about in all cases by properly regulating the dose and the extent of the autolysis of the extract. Occasionally when no chill followed the injection, no effect could be detected. Most of these patients were very toxic and apparently overwhelmed by the infection when the injection was given. In others it was shown by sputum or blood cultures that the infecting organism was the *Streptococcus mucosus*. One patient failed to react in the typical manner, and a positive diagnosis of tuberculosis was made from a sputum smear. Reactions were usually associated with a marked rise in leukocytes during or soon after the chill, which dropped to the former level or lower the next day. In patients showing no apparent effect, there was little or no change in the leukocyte count.

Six patients died. Five of these used alcohol to excess, and the one who did not use alcohol had a *Streptococcus mucosus* pneumonia. In the fatal cases no apparent effect followed the injection (10 c.c. of Extract 292 in all) in four, while in two, the usual effect was noted. The average age of the patients who died was 35 years; of those who recovered, 32. The average time of the first injection in the former was four and one-half days; that in the latter, five days.

We now mention a fact concerning this series of cases which it is impossible to demonstrate by tables or record sheets. It is a fact which we hesitate to incorporate in this report because of lack of confirmatory evidence. Nevertheless, the patients obtaining the antigen, and failing to react in a typical manner, apparently ran a more favorable course with less discomfort even when the disease ran its full course than when the pneumonia was not so treated.

The one bad feature in this method of treatment is the chill. This we were unable to avoid when giving doses sufficiently large to affect the course of the disease. The severity of the chill varied greatly in different persons even with the same dosage. Because of the apparent danger of chill, the fact that we were unable to foretell its severity, the apparently transient beneficial effect, and our inability to alter the course of the disease favorably in the more severe cases, this method was abandoned since it offered nothing that could not be more safely produced by the subcutaneous injection of partially autolyzed pneumococci.[4]

The treatment of disease by the intravenous injection of nonspecific substances which call forth severe chill and accompanying severe reaction, while of apparent benefit in some instances, as pointed out especially by Jobling and Petersen,[5] would for obvious reasons appear to be dangerous; therefore we warn against their indiscriminate use, especially in lobar pneumonia, until the nature and degree of the reaction are better understood and can be accurately controlled.

4. The results of this treatment during the past two years are soon to be published.
5. Jobling, J. W., and Petersen, W.: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, p. 1753.

EXPERIMENTAL SCURVY PRODUCED IN GUINEA-PIGS BY MILK AND MILK PRODUCTS *

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Much has been written during the last few years concerning the value of the different constituents of the diet in the maintenance, growth and reproduction of animals. When animals such as white rats are fed a diet consisting of mixtures of pure proteins, carbohydrates, certain fats, and salt mixture of appropriate composition, growth fails to take place after a short time.[1] Such a diet, although fulfilling all the energy and caloric requirements, is inadequate to maintain the normal growth of the rat. When such fats as butter fat,[2] egg yolk fat,[2] kidney fat,[2] cod liver oil[3] or beef fat[3] are added or replace such inefficient fats as lard or olive oil, growth is stimulated. McCollum and his co-workers, and Mendel and Osborne have repeatedly demonstrated that butter fat contains something essential for growth in addition to what may be needed for maintenance. The nature of this remarkable growth promoting substance is not known, although it is not destroyed by heating butter fat with live steam[3] or by saponification,[4] and by fractional crystallization it has been concentrated in the "oil" fractions.[5] However, the growth stimulating factor is much less stable when concentrated in the "oil" than in the butter fat.

In 1907, Holst and Fröhlich[6] produced a condition in guinea-pigs which resembles human scurvy by the feeding of oats, bread and unpeeled grains. In a more recent work,[7] they also observe that fresh vegetables have the property of preventing the disease, that is, that they are antiscorbutics. Funk[8] and others have made it clear that the feeding of isolated foodstuffs and polished rice induces polyneuritis or beriberi in birds, and that this is relieved by the introduction into the diet of water extracts of several natural foods, as yeast or oats. These substances, which act as antineuritics and antiscorbutics, Funk has designated as "vitamins," and the diseases which arise from their lack as deficiency diseases or "avitaminoses." More recently it has been shown[9] that butter fat will not cure the symptoms of beriberi in pigeons. From these observations it seems that in addition to the ordinary food constituents, such as proteins, carbohydrates, fats and inorganic salts, we have to consider two other essential substances or groups of substances, one a fat soluble having the property of promoting or stimulating growth, and a second a water or alcohol soluble substance which is capable of preventing or relieving the so-called "diet deficiency" diseases.

Milk appears from a perusal of the literature to be well supplied with both of these substances, and at the same time to have the other food constituents in such appropriate proportions that it has long been recognized as an ideal food. Funk[8] states that raw milk is an antiscorbutic. He prevented the onset of scurvy and loss of weight by feeding guinea-pigs 50 c.c. of uncooked milk daily in addition to an oats diet.[10] Hopkins,[11] by introducing as small a quantity as 2 c.c. of milk to white mice on a diet of purified foodstuffs, promoted growth when with no milk the animals lost weight. Osborne and Mendel[1] say:

> In our numerous experiments milk has proved to be an adequate food, both for growth and maintenance. Young rats fed solely on milk food which we have been accustomed to use (milk powder 60 per cent., starch 12 per cent., lard 28 per cent.) not only have grown from infancy to full maturity, but have also given birth to litters of normal young which in turn have thriven on diets precisely like those furnished to their parents. One must conclude from these facts that the milk food contains all that is essential for growth and maintenance.

Likewise Keller[12] and Janet Claypon[13] could observe no difference in mice and rats fed on raw and cooked cow's milk. Peiper and Eichloff[14] observed, on the contrary, that dogs fed on raw and sterilized milk developed a fragility of the bone, and small hemorrhages were found around the epiphyseal borders. Rabbits succumb when fed on cow's or woman's milk, according to Moro.[15]

Bartenstein,[16] by feeding cooked and raw cow's milk to guinea-pigs, produced a condition having many features similar to infantile scurvy. Fröhlich[17] finds this to be true, but concludes that cooked milk produces more severe lesions. He likewise believes that raw milk contains more of the antiscorbutic substances than do pasteurized or cooked milk, finding that milk pasteurized (70 C., 158 F., for thirty minutes) preserves a large but uncertain portion of its antiscorbutic properties, while milk heated for ten minutes at 98 C. (208.4 F.) completely loses this property. After elimination of the caseinogen and other proteins, Funk[18] found that the milk still retained this preventive and curative property. An attempt by him[18] to isolate the antiscorbutic substance in milk was not successful.

AUTHOR'S EXPERIMENTS

Pasteurized Milk.—We at first fed guinea-pigs on pasteurized milk. This had been heated to 140 F. (60 C.) for from twenty-five to thirty minutes, and according to Fröhlich contains a large part of its antiscorbutic properties. The animals were given all the milk they could drink. Timothy hay was used for bedding in all our experiments. For the first two weeks the guinea-pigs so fed gained rapidly in weight, more rapidly than the control animals on a mixed vegetable diet. At about the end of the third week the wrist joints became painful to pressure followed by palpable swelling in the course of from twenty-four to forty-eight hours. Occasionally swelling is observed

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* Read before the Section on Pathology and Physiology at the Sixty-Seventh Annual Session of the American Medical Association, Detroit, June, 1916.

1. McCollum and Davis: Jour. Biol. Chem., 1913, xv, 166. Osborne and Mendel: Ibid., 1913, xv, 311. Hopkins: Jour. Physiol., 1912, xliv, 425.
2. McCollum and Davis: Jour. Biol. Chem., 1915, xxi, 179.
3. Osborne and Mendel: Jour. Biol. Chem., 1915, xx, 379.
4. McCollum and Davis: Jour. Biol. Chem., 1914, xix, 245.
5. Osborne and Mendel: Jour. Biol. Chem., 1916, xxiv, 37.
6. Holst and Fröhlich: Jour. Hyg., 1907, vii, 634.
7. Holst and Fröhlich: Ztschr. f. Hyg. u. Infektionskr., 1912, lxxii, 1.
8. Funk: Die Vitamine, Wiesbaden, 1914.
9. Funk and McCollum: Jour. Biol. Chem., 1915, xxiii, 413. McCollum and Kennedy: Ibid., 1916, xxiii, 491.
10. Funk: Biochem. Jour., 1913, vii, 81.
11. Hopkins: Jour. Physiol., 1912, xliv, 425.
12. Keller: Ztschr. f. diät. Therap., 1904, vii, 90.
13. Lane-Claypon, Janet: Jour. Hyg., 1909, iv, 233.
14. Peiper and Eichloff, quoted from Funk, Die Vitamine, Wiesbaden, p. 87.
15. Moro: München. med. Wchnschr., 1907, liv, 2223.
16. Bartenstein: Jahrb. f. Kinderh., 1905, lxi, 22.
17. Fröhlich: Ztschr. f. Hyg. u. Infektionskr., 1912, lxxii, 155.
18. Funk: Biochem. Jour., 1913, vii, 211.

with the first signs of tenderness. The joints may continue to enlarge until they are two or three times their normal size. After two or three days the knee joints undergo similar changes, while occasionally the ankle, elbow and shoulder joints become affected in the order named. The swelling at the wrist joint is closely confined to the ends of the long bones, ulna and radius; that at the knee is about the heads of the tibia and fibula. Although the swelling may spread to encompass the entire joint and even into the tissues of the leg and calf, it is most persistent around the tibia, and it is here that subsequent changes are most frequent. An enlargement of the costochondral junctions, resembling a rachitic rosary, is in many instances palpable a week after the initial symptoms. As the disease progresses the acute swellings may be replaced by exostoses at the wrists and knees and fragility of the bones with fractures.

With the appearance of symptoms the animal loses weight, and if the disease progresses may die. However, of over thirty guinea-pigs fed on pasteurized milk, only four died of the disease. During the stage of acute symptoms there may be a marked loss of weight, or the weight may remain stationary for several weeks. If the animal is placed on a vegetable diet, it regains its health and the symptoms disappear. If continued on a pasteurized milk diet, it may have several exacerbations of the disease with marked deformities from exostoses and fractures, or may apparently recover and continue to grow, but more slowly than with normal diet.

Five of the guinea-pigs in this series did not have symptoms of scurvy, although fed on milk for from thirty to 146 days. It has been our experience that large pigs do not get as severe symptoms when fed on milk as younger animals, and this may account for the nonappearance of scurvy in these animals. In the majority of our experiments, guinea-pigs weighing from 80 to 150 gm. were used. The average time for the onset of symptoms was nineteen days; but this is variable, the earliest lesion appearing the tenth day and the latest the twenty-ninth in those having palpable lesions. A few animals presenting no clinical symptoms had small hemorrhages about the wrists and knee joints at necropsy. This leads to the possibility of unrecognized lesions in the large pigs previously mentioned.

The gross alterations vary considerably, dependent on the age and length of the feeding period. The most constant alteration at necropsy is hemorrhage. This may be the only lesion. The hemorrhages are most frequent around the wrist joints, over the knees, and in the muscles of the hind legs and in the bone marrow in the ends of the long bones. They may be few and small, or very large. Edema frequently accompanies the hemorrhage, and it alone or with the latter is apparently the cause of the primary swelling around the joints.

The lower ends of the ulna and radius are enlarged and yellowish white, with the consistency of cartilage. The upper ends of the tibia and fibula have a similar appearance. More rarely the lower ends of the tibia, fibula and femur enlarge. The bones become fragile, often being fractured during manipulation. Fractures at the epiphyseal junctions of the radius, ulna and tibia are not infrequent. Infractions are sometimes found with the periosteum holding the bone in place. The fractures produce various deformities which may entirely disappear after healing.

Enlargements of the costochondral junctions, with or without hemorrhage, are occasionally observed, producing a "rachitic rosary" comparable clinically to rickets in man. The lymph glands, especially the inguinal group, are enlarged in the majority of animals, and often hemorrhagic. The spleen was frequently enlarged. In general the viscera possess no important gross changes. We observed no loosening of the molar teeth or fragility of the maxillae as is usually found in animals having scurvy from diets of grains.

On microscopic examination, hemorrhage was present in all animals in which there was any alteration. They are widely distributed, being found in the muscles, bone marrow, especially at the ends of the diaphyses of the long bones, periosteum, tooth pulp and more rarely in the skin. They vary as to size and diameter. Small and well circumscribed hemorrhages occur early in the disease and in the milder forms. The larger hemorrhages occur more frequently in the severe and later forms of scurvy.

Lesions having the shape, location and characteristics of infarcts are found in the ends of the diaphyses of the long bones. These are more prominent in the severer forms of scurvy produced by oats. In the earliest lesions there is no change in the tissues at the site of hemorrhage. Necrosis is not a prominent feature until after the third week in milk-fed pigs. Necrosis then occurs at the costochondral junctions of the ribs and at the ends of the diaphyses of the long bones affecting chiefly the bone and bone marrow, to a less extent the cartilage, and is most marked at the periphery, where the compact bone is sometimes completely destroyed for a short distance. Fractures at these points are rather frequent.

The appearance observed in the process of healing largely depends on the extent of the earlier changes and the duration of the disease. If the alterations have been slight, there may simply be changes in the character of the bone marrow near the costochondral and epiphyseal junctions. Following the marked early changes, large hemorrhages, necrosis and fractures, there is more or less deformity. The reparative process in bone in this disease is by the formation of osteoid, cartilaginous and bony callus. One observes in the region of the epiphyseal cartilage a fibroid marrow, marked irregularity of the diaphyseal margin of the epiphyseal cartilage and at the periphery osteoid, cartilaginous or bony callus.

Degenerative processes in the muscles, particularly of the leg and thigh, were a characteristic feature. Certain portions of a muscle fiber would be entirely disintegrated, while surrounding fibers would appear unchanged. These lesions appear to be entirely independent of the hemorrhages.

It is of interest to note, in connection with the ease with which scurvy can be produced in guinea-pigs on a diet of pasteurized milk, the recent statement of Holt[19] that infantile scurvy has increased in New York City since the introduction of pasteurized milk, and in the experiments of Hess,[20] in which babies fed on Grade A milk which had been heated to 145 F. for thirty minutes developed a more or less marked form of scurvy, while others receiving orange juice were entirely free from the disorder.

Raw Milk.—With the possible exception of Bartenstein, all the authors previously referred to support

19. Holt, L. E.: Discussion on article by Hess, A. F.: Footnote 20.
20. Hess, A. F.: Group Similarities of the Deficiency Diseases: A Study of Infantile Scurvy, abstr., THE JOURNAL A. M. A., May 20, 1916, p. 1654.

the idea that raw milk is efficient in producing growth or contains antiscorbutic substances. Nine guinea-pigs, varying in size from 80 to 160 gm., were fed exclusively on raw certified milk. Seven had scurvy symptoms on the twelfth day, and two others by the twenty-second day. These lesions were identical with those described in the preceding group. All the animals had swollen wrists and costochondral junctions. Two had hyperemia, and one petechial hemorrhages at the base of the lower incisors. Five of the guinea-pigs died, death occurring as early as the seventeenth and as late as the forty-eighth day.

In a later experiment, three guinea-pigs, weighing from 270 to 350 gm., were fed with raw milk. They apparently did not care for the milk as do the younger animals, and gained less in weight. Two had swollen wrists and knees by the twelfth day. The third pig had no lesions after the thirtieth day. A fourth pig, weighing 160 gm., fed on the same milk, grew very rapidly, gaining 140 gm. in twenty-five days, but had no lesions of scurvy until the twenty-ninth day. Notwithstanding the prevalent idea that cow's milk is an ideal food, we wish to emphasize the important fact, as deduced from our experiments, that raw cow's milk does not act as an antiscorbutic for guinea-pigs, but on the contrary produces scurvy in these animals.

Such a statement appears to be in discord with the success of Osborne and Mendel[1] in feeding milk food to white rats, and of Hopkins[11] in stimulating growth in white mice with small amounts of milk. We believe that this variability of results is due to the difference in the species of the animals employed. A diet which is sufficient for growth and maintenance in one species may be either similarly adequate for another,[21] may be sufficient for maintenance, or may produce one of the so-called deficiency diseases. It is also apparent that conclusions based on dietary experiments on one species of animals can in all probability be applied only to that species. This feature will be considered again in the discussion of the proprietary baby foods.

Boiled Milk.—The effect of boiled milk was next tested. The milk was boiled for from ten to fifteen minutes. Thirteen animals were subjected to this diet. Ten had lesions of scurvy, these appearing at about seventeen days. Two large pigs did not develop symptoms, although being on the diet for sixty-six days. A third has no lesions after thirty days. We could distinguish no difference in the onset and extent of the lesions in the animals fed on raw, pasteurized or cooked cow's milk. The time of onset of the disease in individuals of all groups was variable.

It is to be noted that the time of onset of symptoms is not the same in all individuals. In fact, a small number of the animals in each group discussed have not developed symptoms of the disease, although fed on a diet for a considerable time. This ability of some animals to resist the disease is an individual characteristic. It is possible that the more resistant have some essential substance stored up in their tissues capable of combating the toxic substances that produce the disease. These essential substances may be rapidly used up in the animals which have early symptoms. McCollum and Davis[4] report a similar individual variation in their experiments:

> In our extensive experience with rations made up of purified casein, dextrin and salt mixtures from reagents we have observed a marked difference in the ability of individual rats to grow on such diets. Many fail entirely to grow, others grow at decidedly under the normal weight; and normal growth during a period of somewhat more than one hundred days can be attained only by exceptional rats.

Various Diets.—A large number of guinea-pigs were fed on carrots, cabbage, lettuce and other green vegetables with hay for long periods. These grew normally and had no symptoms of scurvy. This is the customary diet for our guinea-pigs, and we have never observed scurvy in animals on such a mixture of foods. Likewise no animals in our experience have had scurvy when fed on a mixture of carrots and oats.

Three guinea-pigs fed on milk, vegetables and oats developed mild symptoms of the disease after twenty-one and forty-one days. Several others on the same diet had no lesions. In a previous paper by Moore and Davis,[22] the occurrence of a scorbutic outbreak among guinea-pigs, which were fed in addition to oats and green vegetables milk from a cow with experimental streptococcal mastitis, is described. After the addition of the milk to the ordinary diet nearly all the young guinea-pigs had scurvy, the older ones rarely getting the disease. As the amount of milk taken by each animal was not ascertained, there is always the factor that those animals affected may have consumed more of the milk than the others. The point to be emphasized, however, is that milk when added to a diet of green vegetables considered to be preeminent as antiscorbutics will produce scurvy in some of the guinea-pigs thus fed.

The classical work of Holst and Fröhlich has conclusively demonstrated that when guinea-pigs are fed on an exclusive diet of oats they readily succumb to a very severe type of scurvy. Our experiments completely confirm their conclusions. In every instance looseness of the molar teeth with hemorrhages into the gums or muscles of the lower jaw, together with the symptoms previously described, were a constant feature. The animals gained little in weight preceding the onset of the disease, afterward rapidly became emaciated, and death occurred on an average after thirty-two days.

In our experiment in which pasteurized milk and oats were fed together, the animals grew rapidly, each gaining 80 gm. in comparison to the 20 gm. on the oats alone before the onset of symptoms. The symptoms appeared on the nineteenth to the twenty-sixth day and were very severe; but the animals lived for over two months on the mixed diet. In a second experiment in which raw certified milk was fed with oats, the animals showed a similar rapid growth, developed scurvy on about the twentieth day, and these lesions were slightly more marked than those on the raw milk diet alone but not so severe as those caused by the exclusive oats diet. We agree with Funk that unboiled milk in addition to oats will prevent loss of weight, but fail to find that it prevents scurvy.

We have produced scurvy in guinea-pigs by feeding exclusive diets of skim milk, condensed milk, and casein in water. The last two produce a severe type of the malady with looseness of the molar teeth and death. On cream diets the animals succumb in a few days to a type of fat constipation. No macroscopic lesions of scurvy were observed.

Counts of the leukocytes of several guinea-pigs made before and after the appearance of lesions show that there is no appreciable increase. There is likewise no rise in temperature during the disease.

21. Hart and McCollum: Jour. Biol. Chem., 1914, xix, 378.

22. Moore and Davis: Tr. Chicago Path. Soc., 1914, ix, 185.

Our experiments with some of the proprietary infant foods, when compared with those of Wheeler and Biester,[23] well illustrate previous assertions that the nutrient value of different dietaries is applicable only to the animal species employed. These authors find that unmodified Horlick's malted milk and Nestlé's food, mixtures of milk and malted grain, appear to be a complete food for white mice, allowing for the maintenance of constant body weight, during relatively long periods. Mice fed on unmodified Mellin's food and Eskay's albuminized food, which are made from grains and contain no milk, had a steady loss in weight. These preparations were not capable of serving as an exclusive ration.

When guinea-pigs were fed exclusively on unmodified Horlick's malted milk, Nestlé's food and Mellin's food, some gained rapidly in weight but developed symptoms of scurvy by eleven days, and after a rapid loss of weight died on an average after eighteen days. At necropsy the lesions were found to be more general than on any of the milk diets, comparable in their severity to the condition caused by oats ration. There appeared to be no difference between those foods having milk in their composition, as the Horlick's malted milk and the Nestlé's food, and those composed solely of grains, as Mellin's food. Our results in this respect agree with facts well known among clinicians that the exclusive use of unmodified proprietary infant foods is apt to produce infantile scurvy.

SUMMARY

Scurvy has been produced experimentally in guinea-pigs by the exclusive diet of raw cow's milk. Pasteurized, boiled and skimmed cow's milk will cause a similar condition. A severe form of the disease has been produced in these animals by condensed milk, casein and water, and several proprietary infant foods. Raw cow's milk when added to oats was not found capable of preventing the onset of scurvy. In a few animals scurvy has developed when milk has been added to a general diet of green vegetables. The onset of symptoms in the individual animal is a very variable factor, some having a marked resistance, and others succumbing more rapidly. From our results we find that the older animals are more resistant.

From a comparison of our results with those of investigators using other animal species, it appears that a ration which may be entirely adequate in nutritive value for one species may be inadequate for another. While there is a marked individual variation toward diets in each species, the species variation is still greater.

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ABSTRACT OF DISCUSSION

DR. VICTOR C. VAUGHAN, Ann Arbor, Mich.: This paper is interesting to me because many years ago I started to prove that formaldehyd when added to milk made the milk injurious. I took many batches of guinea-pigs, divided them into two sets each, and fed one on normal cow's milk, and the other on cow's milk with varying proportions of formaldehyd in it. I was going to prove that formaldehyd was a terrible poison which should not be added to the milk, and the conclusion I reached was that the milk that had no formaldehyd in it had just as injurious an effect and killed just as quickly as the milk with formaldehyd in it.

DR. W. W. FORD, Baltimore: I am very much interested in this paper, in the first place, because of the apparent contradiction expressed by men in pediatrics in this country, and in the second place, it hinges on certain work which we have been doing in our laboratory for a number of years, and which I would like to explain briefly so far as it relates to this work.

At the present time pediatricians in this country are divided into two camps. In one are those individuals who have long maintained that pasteurized milk and boiled milk produce scurvy. In the other are a large group of individuals who say that it does not produce scurvy, and even if it does the scurvy is of no consequence inasmuch as it can be controlled with comparative ease by the addition of some substance like orange juice. Dr. Holt's statement that scurvy has increased in New York City as the result of the increase in the pasteurization of milk there is a matter of considerable importance. At the same time I want to emphasize the fact that there are cases of scurvy which are superinduced by the use of boiled milk, although they are very uncommon. We recently had one in Baltimore. Milk is a very treacherous substance. Milk in Baltimore is not what it is in New York or in Chicago. Baltimore milk properly pasteurized has lost its capacity of souring and curdling normally. Such milk has lost its lactic acid bacteria. The consequence of the development of the bacteria in such milk is the evolution of toxic products, the evolution of hemolytic substances which are clearly due to the development of the *Bacillus acrogenes-capsulatus*. Such milk if allowed to stand for any considerable period of time is distinctly poisonous to animals. It seems to bring on symptoms of protein intoxication, although our experiments are not sufficiently definite to make this a positive conclusion.

That milk is practically identical with boiled milk. From what I have heard of the conditions in New York City, the pasteurized milk there does acidify and clot, due to the development of lactic acid bacteria and the evolution of lactic acid, and apparently the same thing holds true in Washington. When, therefore, we come to consider the difference between raw milk and boiled milk we should not forget that we are using entirely different substances, and the different action which might be shown on animals may be explained by the fact that certain protective substances present in raw milk are destroyed in the act of boiling. But there is another explanation which we should not forget, and that is that in the boiling of milk we destroy all the bacteria which tend to inhibit the development of the spore-bearing organisms. Boiled milk, in our experience in Baltimore, always rots, and it rots with the production of noxious disagreeable substances, substances with a very disagreeable odor. I cannot help but think that the use of milk of that character, just as soon as the organisms have had time to develop to any extent, is an entirely different thing from the use of milk containing lactic acid organisms which in their evolution and their multiplying develop and cause the evolution of lactic acid and produce the acidification and clotting of the milk.

DR. L. R. WILLIAMS, Albany, N. Y.: About a year ago we first heard of the work of Dr. Hess in Mount Sinai Hospital in New York who found that a number of children fed on pasteurized milk had developed scurvy; and during this winter Dr. Holt made the statement in New York that scurvy had been on the increase among the children in New York. Last year there were eight deaths from scurvy in New York; during the last ten years they averaged about nine, varying from seven to twelve in number. In New York, Boston and Chicago they have had pasteurized milk (perhaps 80 per cent. of the milk being pasteurized) for the past four or five years, and the number of deaths from scurvy had not increased. In these three cities infant mortality has steadily diminished, whether due to that reason alone or not I cannot say. We know that pasteurized milk may induce scurvy in children, but if, as often happens, the milk dealers in a city are opposed to pasteurization, they take that point from every scientific paper that is read and advertise it in the newspapers and herald it all through the state. I wish that those of you who are experimenting with the use of pasteurized milk would bear in mind the fact that there are infinitely more deaths caused among infants by the feeding of raw milk than by pasteurized

23. Wheeler, Ruth, and Biester, Alice: A Study of the Nutritive Value of Some Proprietary Infant Foods, Am. Jour. Dis. Child., March, 1914, p. 170.

milk, not only by the filth which is in the milk, but also by the infective organisms carried by milk, and that the amount of illness and death caused by pasteurized cow's milk is far less than the amount of illness and death caused by the use of raw milk. If we bear this in mind I think that many arguments against the use of pasteurized milk would be obviated.

DR. J. J. MOORE, Chicago: I was very glad to learn of Dr. Vaughan's experience in feeding guinea-pigs on cow's milk. I believe that practically all the milk for large cities should be pasteurized. Raw milk causes scurvy in guinea-pigs as easily as pasteurized milk. We have fed more guinea-pigs on pasteurized milk than on raw milk, as the former is the milk most generally used in the city. In order to ascertain the effect of boiled and raw milk on guinea-pigs, we have recently undertaken a series of experiments in which three large and three small animals were fed raw milk, and three large and three small animals were fed milk from the same bottle but which had been boiled for fifteen minutes. The three large guinea-pigs fed on raw milk had lesions of scurvy earlier than any of the small animals. Two of the small guinea-pigs fed on raw milk did not develop scorbutic symptoms for thirty days. Of those fed on the boiled milk, one large animal has not shown symptoms of scurvy to date (thirty days); all the small pigs, however, have scurvy. It appears from the work of others that cow's milk is an efficient diet for rats and white mice. It does not seem to be an efficient diet for guinea-pigs. Whether it is a satisfactory diet for all babies is something which we shall have to learn from the pediatricians.

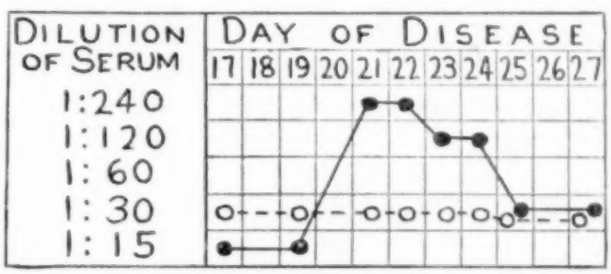
A REACTION OF IMMUNITY IN ACUTE POLIOMYELITIS*

GEORGE MATHERS, M.D.
AND
RUTH TUNNICLIFF, M.D.
CHICAGO

Epidemiologic and experimental investigations have added important facts to our knowledge of immunity in acute poliomyelitis. It has been observed that in widespread epidemics of this disease only a small percentage of the population in the infected area is attacked, and that age susceptibility plays an important rôle; that is, adults usually are immune, and young children are susceptible. Furthermore, as in many other acute infectious diseases, one attack of acute poliomyelitis, whether mild or severe, seems to protect the individual against subsequent infection. These facts have been demonstrated experimentally by many investigators, especially Landsteiner, Flexner, and their associates, and it has been proved that the serum of recovered persons or monkeys contains antibodies which, when the proper experimental conditions are fulfilled, will neutralize fatal doses of poliomyelitis virus. This neutralization occurs when virus and immune serum remain in contact for two hours at 37 C., and for twenty-four hours at refrigerator temperature before inoculation. It has also been noted that the serum of normal adults often exhibits a high antibody content for the infectious agent of acute poliomyelitis — a condition which might well be explained as the result of unrecognized abortive attacks of the disease. The experiments thus far reported indicate that protective substances develop in the blood of persons suffering from acute poliomyelitis which play an important part in their recovery and subsequent immunity.

In a recent communication,[1] Mathers described a peculiar streptococcus-like organism obtained in cultures of the tissues of the central nervous system of patients dead of acute poliomyelitis. Apparently the same organism was also described independently about the same time by Rosenow, Towne and Wheeler,[2] and by Nuzum and Herzog.[3] The complete relationship of the coccus-like organism to poliomyelitis has not been determined as yet, but animal and cultural experiments indicate that this organism, which in many ways resembles the virus described by Flexner and Noguchi,[4] bears a definite relation to the causation of the disease. In view of the fact that protective substances develop in the serum of persons suffering from acute poliomyelitis, it seems a matter of interest to determine whether any definite antibody reaction against this coccus could be demonstrated during the course of the infection. Accordingly estimations have been made of the opsonic power of the blood of patients with acute poliomyelitis.

In this work the dilution method as first recommended by Klein[5] was used, the normal and immune serums being diluted with physiologic sodium chlorid solution in order that it might be determined at what point induced phagocytosis recognizably exceeded spontaneous phagocytosis. Spontaneous phagocytosis was estimated by the amount of phagocytosis in specimens containing salt solution instead of serum. Normal adult human leukocytes were used. The serum of a normal infant 2 years of age was employed as a control when the blood of young children was examined. It is known that the normal opsonic content of infants' blood is less than that of adults.[6] The organisms used in these experiments were typical strains of the poliomyelitis coccus isolated from the brains or cords in fatal cases of acute poliomyelitis. Three different strains of this organism were used at different times, and the results were always similar. A strain of *Streptococcus pyogenes* isolated from a patient with erysipelas, and one of *Streptococcus viridans* from a tonsil were also studied to determine to what extent, if any, the opsonic action might be specific. The suspensions of bacteria were prepared from twenty-four-hour blood-agar-slant cultures, each suspension containing approximately the same number of organisms. The specimens were incubated at 37 C. for thirty minutes, and the phagocytosis in fifty polymorphonuclear leukocytes determined. Both heated and unheated serums were studied in several instances, with similar results.



Opsonic content of the serum of a patient with acute poliomyelitis for the poliomyelitic coccus and Streptococcus pyogenes; Solid line, poliomyelitic coccus; broken line, Streptococcus pyogenes.

The serums of nine patients were examined. Five of these patients were under 2½ years of age, one was

* From the Memorial Institute for Infectious Diseases.

1. Mathers, George: Some Bacteriologic Observations on Epidemic Poliomyelitis, THE JOURNAL A. M. A., Sept. 30, 1916, p. 1019.

2. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: The Etiology of Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, p. 1202.

3. Nuzum, J. W., and Herzog, Maximilian: Experimental Studies in the Etiology of Acute Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, p. 1205.

4. Flexner and Noguchi: Jour. Exper. Med., 1913, xviii, 461.

5. Klein: Bull. Johns Hopkins Hosp., 1907, xviii, 245.

6. Tunnicliff, Ruth: Jour. Infect. Dis., 1910, vii, 698.

4 years, another 2 years, 9 months, and two were adults. All had a mild form of poliomyelitis, only one having any fever during the time in which the serum was examined. A so-called "negative phase" was observed in only two cases, probably because the serum in no case could be examined before the sixth day of the disease. A distinct increase in opsonins for the poliomyelitis coccus, lasting from one to ten days, was observed in seven patients, studied between the sixth and twenty-first days of the disease. Two adult patients, examined once each in the third and fourth weeks of the disease, revealed no change in opsonin. The point of opsonic extinction for the normal infant serum and the poliomyelitis coccus was 1:30 in every instance; for three cases of acute poliomyelitis it was 1:120; for three others 1:240, and for the patient most severely ill, 1:480. The last-mentioned patient retained a high opsonic content for ten days. As the opsonin in question in normal adult serum does not disappear until a dilution of 1:120 is reached, little idea of the opsonic power of the blood of infant patients could have been gained if the serums of normal infants had not been used for controls. There were no changes in the opsonin for *Streptococcus pyogenes* or *Streptococcus viridans* in any of the serums examined. Furthermore, the serum of a patient with scarlet fever gave a high opsonic content (1:480) for *Streptococcus pyogenes*, but no increase above normal for the poliomyelitis organism.

The opsonic curve in the case reported below shows a low content on the seventeenth and nineteenth days of the attack, followed by a definite rise for four days, as indicated in the chart. There was nothing in the history to explain why the rise should occur so late in the course.

E. J., a white girl, aged 2½ years, was admitted to the Cook County Hospital, Oct. 10, 1916, with a flaccid paralysis of the left leg. The child became ill, Oct. 2, 1916; at that time she had some fever and a headache. Paralysis of the left leg was noticed, October 5. Examination revealed nothing abnormal except a marked paresis of all the muscles of the left leg. During her stay in the hospital this paralysis gradually improved.

These results indicate that specific opsonin for the poliomyelitis coccus found in the brains and cords of patients dead of acute poliomyelitis develops during the course of the attack. This opsonin usually appears in the blood during the second week of the disease. That it is specific seems likely, since no change was observed in the opsonin for *Streptococcus pyogenes* or *Streptococcus viridans*. Further work is in progress on this point. The increase in opsonin for the poliomyelitis coccus during the course of an attack of acute poliomyelitis suggests strongly that the organism is of importance in the causation of the disease.

Furthermore, in conjunction with Dr. Katharine Howell, we have found that the serum of rabbits immunized against different strains of poliomyelitic cocci contains antibodies in high concentration, especially opsonin, which are apparently specific for the poliomyelitis organisms. If these results, the details of which will be published soon, are verified, the outlook for the development of a specific immune serum will seem encouraging.

Radium.—During October the United States Bureau of Standards received, for testing, radium to the value of $77,000, which was the largest quantity ever received in one month. More than $1,000,000 worth of radium has been tested by the bureau up to date.

REPORT OF A CASE OF TABETIC OCULAR CRISIS*

J. C. Michael, B.S., M.D., St. Paul

Spiller[1] of Phiadelphia, in March, 1916, reviewed the three cases of tabetic ocular crises previously reported in the literature, and cited a case of his own. These cases have not been fully recognized, and he makes a plea that they be made known.

A flour packer, aged 42, came under my observation, March 1, 1916, in my neurologic service of the City and County Hospital. The previous history was unimportant except for an attack of a manic psychosis of two weeks' duration, two years before. He gave a history of the present complaint almost classically typical of tabes. During the last ten years he had been suffering from a stiffness in the knees, uncertain gait, disturbed urination, lost sexual power, lightning pains in the legs, etc. The serologic and clinical findings were those most commonly found in tabes. The eyegrounds, examined by Dr. C. W. Fogarty, showed double primary atrophy. The patient said that since February, he had been having attacks of sharp, stabbing pains in his left eye, coming on at irregular intervals and lasting several seconds. During these attacks, he saw momentary flashes of light before the affected eye, and also felt irritation in the eye resembling that caused by a hair. The conjunctival mucous membranes became reddened during the attack, and the eye became moistened with tears. This was the story given by him when he entered the hospital. Three weeks later, he gave the following account: "Yesterday morning, on awakening, my left eye felt as though it had swollen the size of a baseball." The skin (over an area from the vertical midline of the face laterally as far as the external border of the left eyebrow and down as far as the mustache) seemed to prickle and feel warm. Pain continued to be felt in the face all day, and numbness in that side of the face continued the following day. There were no visual disturbances.

April 20, the patient stated that he had attacks of numbness and stiffness on the left side of the face, lasting from several minutes to several hours. The gums felt as though they were swollen. These times there were no pains, and no photophobic or lacrimal gland disturbances.

May 1, the patient said that the day before he had the feeling that the left side of his face was coming out, especially the cheek bone. There was burning sensation in the eyeball, lasting about half an hour, with an increase in the flow of tears, and also several momentary attacks of pain and flashes of light before the eye. This syndrome recurred occasionally thereafter. The patient left the hospital, June 27, and died at home in early July.

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REPORT OF A CASE OF BANTI'S DISEASE, WITH NECROPSY FINDINGS

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Resident Physician, Santo Tomas Hospital

Because of the rarity of cases of true Banti's disease, and because of the unusual opportunity afforded in this case of following up in detail all the clinical manifestations from the onset of the first symptom, and then to necropsy, it was thought a report of this kind would be of interest.

History.—C. H., man, aged 28, single, barber, Venezuelan, was transferred from Colon Hospital with a diagnosis of gastric ulcer, Jan. 2, 1916. The patient complained of having vomited large quantities of blood. The family history was negative. No other member was ever affected with the same condition. The patient denied any disease of childhood, and had since always been well. Until fifteen months before, the patient had had malaria almost constantly for two years. For the last six months he had felt fairly well. Other than slight

* Read before the Ramsey County Medical Society, March 27, 1916.

1. Spiller, W. G.: Tabetic Ocular Crises, The Journal A. M. A., March 18, 1916, p. 855.

dizziness and vomiting associated with his malarial attacks, the patient had never had any gastro-intestinal trouble. He denied venereal troubles.

The present illness began Friday night, Dec. 31, 1915, at 10:15, when the patient vomited the food ingested at 7 in the evening. Fifteen minutes later he vomited blood for the first time in his life. The blood was at first dark, but later bright red. Thirty minutes and an hour later, respectively, he vomited blood again. The entire quantity of blood estimated was very large. The patient left the hospital, Jan. 24, 1916, against advice, and returned, March 28, with a history of having had three hemorrhages in the intervening two months. His condition was very poor.

Physical Examination.—At the first admission the patient was fairly well nourished, not very ill, of slightly muddy complexion, anemic, with white pearly sclerae. The spleen reached 4 fingers' breadths below the costal margin and was only slightly tender on deep pressure. Otherwise the examination was negative.

At the second admission the patient had apparently been failing rapidly. The anemia was more marked and he was very weak. The heart was enlarged, with a systolic puff, probably hemic, over the entire precordium. The spleric edge was now definitely higher than during the last admission. Otherwise the physical examination was negative.

Laboratory Findings.—First Admission: Jan. 5, 1916, the blood was negative for malaria; anisocytosis was present; there was no poikilocytosis or nucleated red blood cells. Hemoglobin, from 55 to 60 per cent.; red blood cells, 2,240,000; white blood cells, 3,000. The differential count revealed polymorphonuclears, 41 per cent.; small mononuclears, 57 per cent.; large mononuclears, 1 per cent.; eosinophils, 1 per cent.

Jan. 21, 1916, the blood was negative for malaria; anisocytosis and low hemoglobin content were evident. Hemoglobin, 40 per cent.; red blood cells, 2,168,000; white blood cells, 2,400. The differential count revealed: polymorphonuclears, 43 per cent.; small mononuclears, 43 per cent.; large mononuclears, 12 per cent.; transitionals, 20 per cent. The Wassermann reaction was negative.

Jan. 22, 1916, the differential count revealed: polymorphonuclears, 39 per cent.; small mononuclears, 44 per cent.; large mononuclears, 10 per cent.; transitionals, 6 per cent.; eosinophils, 1 per cent.

Second Admission: The urine showed a faint trace of albumin, and some epithelial and pus cells. The stool was negative. The blood was negative for malaria; a smear showed grave anemia. Red blood cells 1,004,800; hemoglobin, 25 per cent.; white blood cells, 1,850. The differential count revealed polymorphonuclears, 44 per cent.; small mononuclears, 46 per cent.; large mononuclears, 1 per cent.; transitionals, 4 per cent.; eosinophils, 2 per cent.

Course and Termination.—During his first stay in the hospital the patient grew progressively worse even during only a few weeks' observation, and during this time the liver showed evidence of enlargement with some ascites. Some edema of the legs also developed.

He refused operation at this time, and was thought to be in no shape for operation on his second admission, during which his course was rapidly downward. He vomited and passed large quantities of blood by rectum and grew extremely weak. No roentgenoscopy was possible.

On the afternoon of April 3 he complained of a very sharp pain in the abdomen, and died a short time afterward.

Necropsy Report.—The body was that of a well developed and well nourished white man. The skin was very pale, and showed a slight jaundice. The subcutaneous tissues showed marked anemia and a fair amount of fat.

The lungs were collapsed. The left showed a small area of beginning bronchopneumonia at the base.

The pericardium contained 1 ounce of straw-colored fluid. The heart was normal in size and not dilated. The valves were normal. The muscle was very pale and the endocardium had a mottled appearance, the so-called "tiger lily" heart. The aorta was slightly yellower than normal.

The stomach was normal, but the esophagus showed many small varices, one of which had ruptured. The stomach contained 6 ounces of partly clotted blood. The intestines were filled with decomposed blood. The color at the cecum showed chronic follicular colitis, probably of uncinariasis.

The liver weighed 1,575 gm. The surface had numerous grayish nodules, slightly raised and in some places umbilicated. The cut surfaces of these looked like metastases of some malignant tumor. Some of them showed bright yellow areas of bile staining.

The spleen weighed 765 gm. There were very few adhesions to the capsule. The cut surface presented a grayish-white translucent appearance. No trabeculae or bands of fibers were present.

There were few adhesions around the gallbladder; otherwise the peritoneum was normal. Some of the retroperitoneal lymph nodes were larger than normal, and showed hemorrhage into their substance.

The kidneys were very pale; the capsule stripped easily. There was no contraction of the cortex. At the base of the right kidney there was a nodule, the size of a pea, that was white and fairly firm.

The bladder wall was slightly thickened; the mucosa was normal.

The cause of death was secondary anemia following hemorrhages from ruptured esophageal varices.

Microscopic Findings.—Spleen: The capsule and trabeculae showed fibrosis, and the malpighian corpuscles were atrophic, some being almost obliterated. Proliferation of the endothelium was a prominent feature. Infrequent focal areas of necrosis were noted both in the pulp and malpighian bodies. Some yellow-brown pigment as well as an abundance of greenish-black pigment was present. The latter was believed to be malarial pigment.

Liver: There was marked thickening of the capsule. A moderate degree of interstitial cirrhosis also was noted. An advanced stage of passive congestion was present, in some portions representing the "nutmeg" liver. Central and middle zone pressure atrophy of the liver cells was marked. Some of the areas which more nearly approached normal liver tissue revealed phagocyted pigment believed to be of malarial origin. No malignant or large inflammatory areas were found.

Kidney: A moderate degree of parenchymatous nephritis was present. The nodule noted on gross inspection of the kidney specimen received proved on further examination to be a wedge-shaped lesion of fatty tissue with a border of chronic inflammatory process. This lesion from its shape and its location in the cortex suggested an old infarct that had undergone a fatty metamorphosis.

Lymph Nodes: The follicles were atrophic and the reticulum thickened. The venous channels were dilated and filled with blood. A moderate amount of pigment was present in this tissue also.

Physical Impairment

Some figures from the reported experience of the Germania Life in the health service it is carrying on among its own policyholders have an interest. Eighteen months ago, the company offered them the privilege of periodic examinations and of advice on sanitary living and the like, and to last September, 3,482 had applied for this service. A study of a group of examinations made in 1915 by the Life Extension Institute covers a group of 1,154 insured persons of varying ages, averaging 42.6, and having policies that had been in force three years or more. Of this group of persons only fourteen, or 1.21 per cent., passed "perfect" in their physical reexamination; that is, no physical impairment was discovered, and no advice for correcting habits of living was needed. The other 1,140, or 98.79 per cent., did need advice, and in case of 789 of them, or 68.37 per cent. of the whole number, that advice was to seek medical treatment. Of the 1,140 persons who were in some need, either in their physical condition or their mode of living, forty-nine (4.25 per cent.) were "seriously affected"; 740 (64.12 per cent.) were moderately affected, and 351 (30.42 per cent.) were slightly affected, and out of the 789, or 68.37 per cent., who were advised to go to physicians for treatment, only 160 were aware that any impairment existed.—*Insurance*, Nov. 3, 1916.

New Instruments and Suggestions

ARTIFICIAL PNEUMOTHORAX

A SIMPLE APPARATUS FOR ITS INDUCTION

W. J. DOBBIE, M.A., M.D., C.M., WESTON, CANADA
Physician-in-Chief, Toronto Free Hospital for Consumptives

A number of appliances for the induction of artificial pneumothorax have been devised. Some are complicated both in design and construction; some are difficult to operate without assistance; a few are in some respects inefficient, while others are unduly expensive. I have endeavored to construct an apparatus, simple in design and construction, easy to operate without assistance, efficient in the chief essentials, and at the same time very inexpensive.

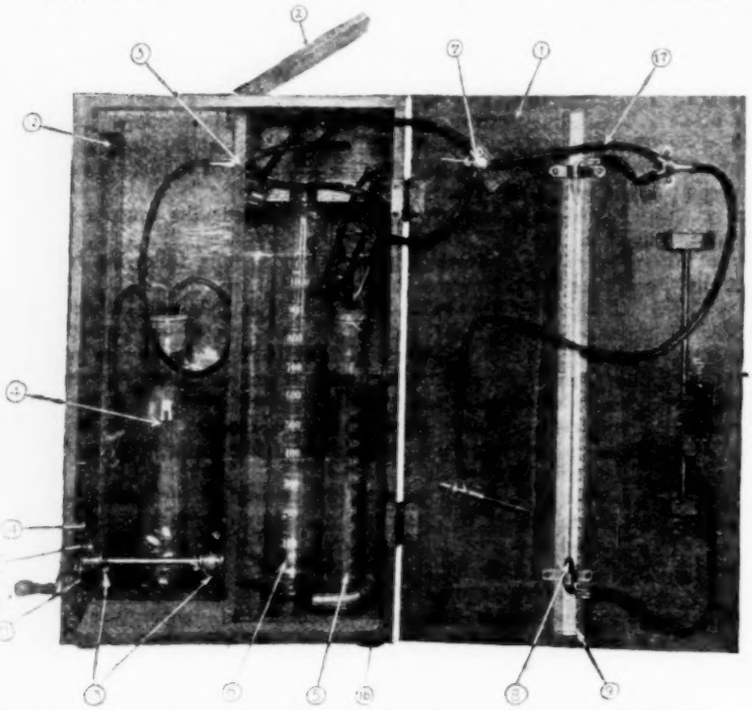

Fig. 1.—Apparatus for induction of artificial pneumothorax, with the water bottle at the lowest point.

The illustrations with the accompanying description may serve to explain the construction and make the advantages clear.

The case, which is simple in design, should be made of material that will not warp. It should not be too large or heavy, so that it may be conveniently portable. There is one large door (Fig. 1, 1) at the front, and on the inside a central partition (3). An important addition is a small trap door (2) at the top.

There are three bottles. The largest (4) is for water. It has a capacity of about 1,500 c.c. The mouth and neck are about 2 inches in diameter. What is known as a candy bottle answers admirably. The smallest (5) is for oxygen, and has a capacity of about 250 c.c. The third (6) is for nitrogen. It has a capacity of 1,000 c.c. Each of these gas containers is set in a circular depression in the floor of the case, and the top of each container is held securely by means of a simple guard, illustrated in Figure 3 *A*.

There is a manometer (8) similar in style to that used in the Parry Morgan apparatus.

For the scale (9), two ordinary millimeter rules are used. The central portion of the scale is painted white to facilitate reading.

There is a three-way tap (7) connecting with the nitrogen and oxygen containers, and with the needle, in such a way, however, that the needle is always in communication with the manometer.

For raising and lowering the water bottle by uniform degrees there is a crank (10), a ratchet wheel (11) and a pulley (12). This appliance is made of metal and consists merely of two spools (13) on an axle connected to the ratchet wheel. The whole is operated by a crank (10) at the side of the case, and controlled by a simple metal brake (14), which also has a release lever (15). The details of the construction of this portion of the apparatus are shown in Figure 3 *B*.

Four small rubber shoes (16) are added on the bottom of the case. These prevent the case sliding when the crank is operating.

If a filter or a heating device should be desired, it may be introduced at the point 17.

The water bottle and the gas containers have rubber stoppers, drilled and fitted with glass tubing in the ordinary way, except that in each of the gas containers, the gas tube is a Y (Fig. 3 *C*), one leg (*D*) being used for delivery to the needle, and the other (*E*) for filling the container with gas. The latter is closed with an ordinary rubber tube and clamp.

Figure 1 shows the apparatus with the water bottle at the lowest point, while Figure 2 shows the water bottle at the highest point.

ADVANTAGES OF THE APPARATUS

1. The whole apparatus, aside from the needle, can be operated by the left hand without assistance.

2. The water bottle can be raised by uniform degrees by means of the crank handle operating the ratchet wheel and pulley.

3. The trap door in the top of the case allows the water container to be raised until the bottom of it is on a level with the top of the nitrogen container, thus making it possible to use the whole of the nitrogen in the container.

4. The manometer can readily be adjusted to stand at zero by the use of the flexible tube connecting the manometer tube with the glass reservoir.

5. Readings of the nitrogen and oxygen containers can be more easily

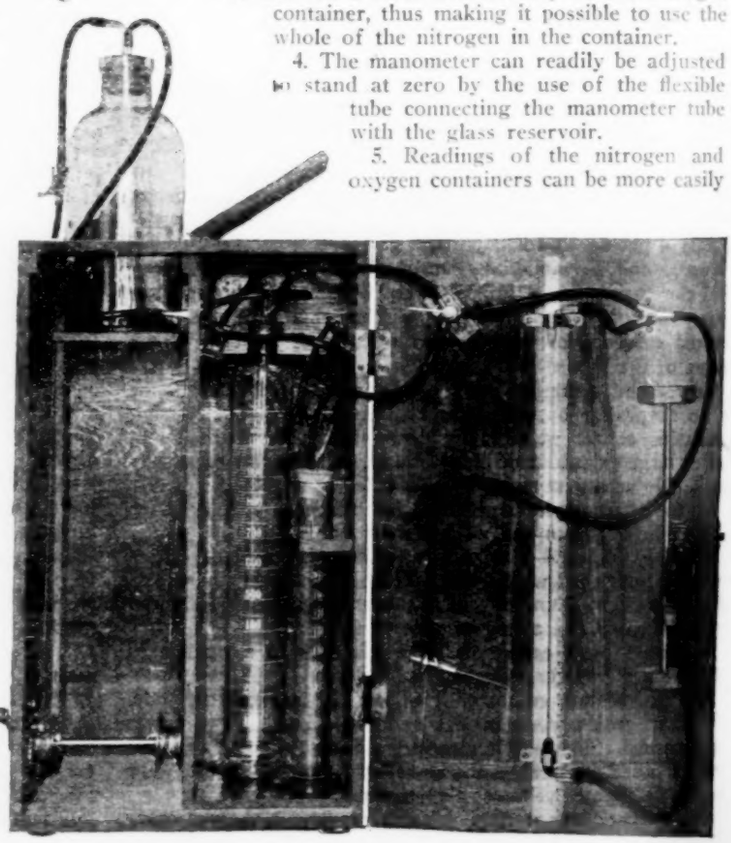

Fig. 2.—Apparatus with the water bottle at the highest point.

taken, since these vessels are of small diameter and greater height.

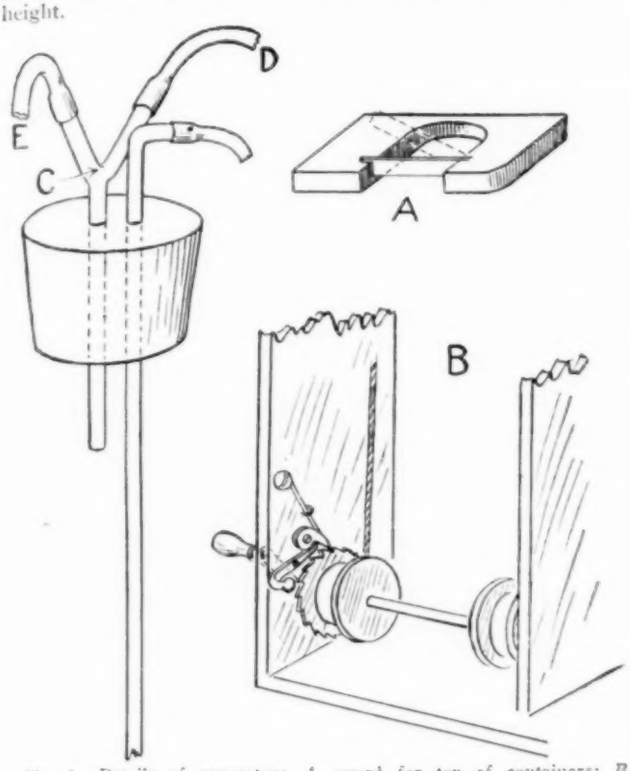

Fig. 3.—Details of apparatus: *A*, guard for top of containers; *B*, mechanism for raising and lowering the water bottle; *C*, Y of gas tube; *D*, leg for delivery to needle; *E*, leg for filling container with gas.

6. The use of the Y tubes on the gas containers obviates the necessity of disturbing any of the rubber tube connections when filling the containers with gas.

A PNEUMOTHORAX NEEDLE

WILLIAM N. BEGGS, A.B., M.D., AND ARNOLD S. TAUSSIG, M.D., DENVER

The needle used in the performance of induced pneumothorax should be provided with a stylet, or obturator which may be used to remove obstructions in the needle without permitting the introduction of unfiltered air into the pleural cavity. While the danger of infection from this source is slight, it is present, and it is impossible to hold either the

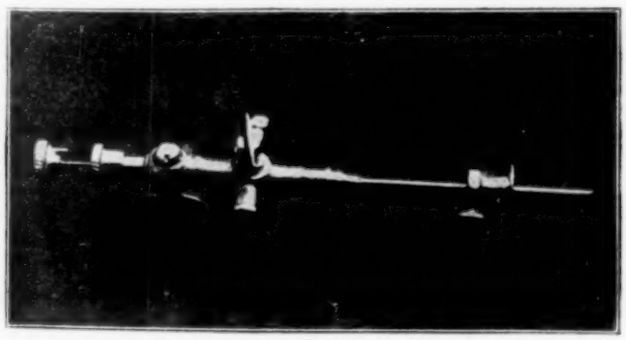

Fig. 1.—Beggs-Taussig pneumothorax needle.

operator or the technic entirely blameless in case pleural exudate does occur in the course of the treatment unless this has been adequately guarded against. As is well known to all experienced operators, this is a frequent complication and one not without danger to the patient.

For these reasons, and because none of the needles with which we were acquainted proved satisfactory to us in practice, we have devised the needle herewith illustrated, which has been made for us by the Durbin-Muckle Surgical Instrument Company of this city.

One of the side nipples is provided with a standard thread so that a hypodermic or record syringe may be attached for aspiration if desirable for diagnostic purposes, or a connection may be made with the larger aspirator for the removal of fluid.

The adjustable safety guard or stop is of considerable advantage. It prevents the needle from plunging too deep as a result of the sudden loss of resistance on puncturing the pleura, and from gradually working down during the introduction of the gas. It also furnishes a convenient support for the hand holding the needle.

About nine months' use of the needle shows that it possesses the following practical advantages:

1. The obturator cannot be unintentionally disconnected during the operation, but is easily removable for purposes of cleansing.

2. The needle is not top-heavy, thus obviating a serious and constant annoyance connected with the use of some of the best-known needles.

3. The needle is well balanced laterally, and hence more easily manipulated.

4. In case an exudate is present, the needle conveniently permits the alternate withdrawal of fluid and introduction of gas, if such procedure is desirable, both in measured quantities, without alternate disconnection and connection of the apparatus and without interference with the manometric readings, during the introduction of the gas, owing to fluid in the needle.

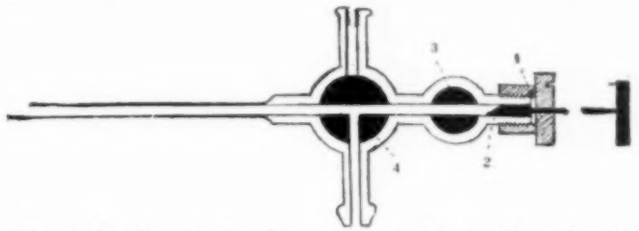

Fig. 2.—Working drawing (not made to scale): 1, felt washer for filtering any air that may pass during the manipulation of the stylet; 2, obturator, or stylet, withdrawn to permit the passage of the gas; 3, quarter-turn, two-way cock for cutting off the air from the stylet during the passage of the gas; 4, half-turn, three-way cock for the alternate use of the gas pressure apparatus and the aspirator.

5. It is cheaper than any needle in the market approaching it in completeness or convenience of manipulation.

A NONPLUGGING ASPIRATOR FOR EMPTYING THE GALLBLADDER

DAVID C. STRAUS, M.D., CHICAGO

Emptying the gallbladder with a trocar when the bile is thick and viscid is not readily accomplished by means of the ingenious Ochsner trocar, unless some form of suction apparatus is attached to the lateral arm of this instrument. In case suction is thus made, the cannula tends to become plugged by the gallbladder mucosa being drawn up against the end of the tube, and further aspiration is prevented until the gallbladder wall is released by making a little positive pressure to force the mucosa away again.

Some time ago Dr. L. L. McArthur remarked to me that an aspirator with one or more holes, so protected that the gallbladder mucosa would be prevented from being drawn up against them, would be a desirable instrument.

It occurred to me that if one constructed a cannula in the form of a fluted metal tube with closed end and multiple openings placed laterally in the depressed longitudinal folds, the difficulty would be overcome, as the mucosa would be held away from the holes by the longitudinal ridges.

I had such a cannula constructed, similar to an Anglin irrigating urethral catheter, but having fewer openings and these considerably larger and extending for a shorter distance from the distal end of the tube. This cannula is connected

to a large aseptic glass and metal syringe by means of a piece of firm rubber tubing. A few trials sufficed to show that the gallbladder mucosa would not obstruct this tube. As the end of the cannula is closed and smooth, one can move it about freely without fear of injuring the gallbladder mucosa; and, owing to the curve in the instrument, one can reach well down into the neck of the gallbladder, or even down into the bile ducts, in case these are dilated.

As regards technic, in emptying the gallbladder, a few words may be helpful. The gallbladder wall is grasped by two Kocher artery forceps placed rather closely together near the fundus of the gallbladder. These are used as tractors to hold up the gallbladder as high as possible. A purse-string suture of catgut is now introduced in the area between the two forceps, and a single provisional knot is made, but

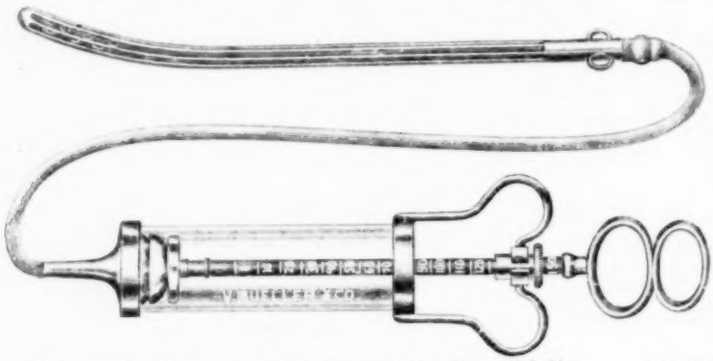

Fig. 1.—Nonplugging aspirator for emptying the gallbladder.

left loose. Finally, a small stab incision is made into the gallbladder, at the center of the purse-string, the aspirator is quickly introduced, and the purse-string drawn tight to prevent leakage. After the gallbladder has been emptied, and examined, the purse-string may be used to close the opening in the gallbladder, in case cholecystectomy is found necessary, whereas, in case one decides to perform cholecystostomy, it may be used as the first suture to close the gallbladder wall about the drainage tube which is inserted.

The instrument has been used for some months at the Michael Reese Hospital, not only to empty the gallbladder,

Fig. 2.—Details of cannula: *A*, holes in flutings.

but also to aspirate the contents of the dilated bile passages, the cystic, hepatic and common ducts. It may also be used to empty other hollow viscera, as for example, the stomach.

5 South Wabash Avenue.

Rheumatism and Exposure.—The reports which from time to time are available from the medical authorities at the base hospitals are always of absorbing interest, and the figures which have been published last year and this are of no small moment, as they tend in many instances, to upset the most well founded theories as to the causation of certain forms of disease. The comparatively small number of cases of rheumatism which have been reported from the trenches is somewhat surprising, in view of the conditions which are well known to obtain there. The average opinion as to the result of long immersion in mud and water is that it would most certainly incline to a serious rheumatic attack, but the fact that such has not been the general findings is a help in the rather confused state of our ideas on the point. The protagonists of the microbic theory of acute rheumatism will find plenty of evidence to support their view, for no greater occasion for the general spread of this crippling disease could be found than in the winter conditions which all combatants must suffer in this unnatural war, if the climatic theory be true.—*Medical Press and Circular*, Nov. 15, 1916.

Therapeutics

DISTURBANCES OF THE KIDNEYS

(*Continued from page 1851*)

INCREASED ACIDITY OF THE URINE

A hyperacidity of the urine may have no relation to the amount of uric acid excretion, but it is generally associated with a diminished bulk of urine, with high specific gravity, with a tendency to deposit, on standing, the amorphous urates with perhaps uric acid and oxalates. A deposit of "brick dust," so called, does not prove that such a sediment is largely uric acid.

An increased acidity of the urine and a too concentrated urine may cause backache; slight ureteral stinging pains, with or without the passage of an actual concretion; bladder irritability, due to irritation at the neck of the bladder, and an increased frequency of urination, with the passage of a small amount of urine. Such urine with the mucus and bacterial conditions right may deposit calculi in the kidney pelvis, or at times in the bladder.

Patients suffering from this disease should avoid meat (including fish and fowl), purin substances (tea, coffee, fish roe, etc.), and alcohol, and drink daily a large amount of pure water. Haskins[1] has recently shown the value of diluted urine, in rendering uric acid as well as salts more soluble. This should be included in the treatment as well as some alkaline drug, as sodium carbonate, or perhaps better, sodium or potassium citrate in 2 gm. doses, three times a day. All mineral acids should be avoided, and all drugs that render the urine acid.

A modification of the foregoing intensive treatment may often be sufficient for relief and for temporary cure at least, but patients who have suffered from this increased acidity of the urine must for some time modify their diet and water drinking to prevent recurrence.

OXALURIA

The term "oxaluria" has been applied to the condition in which calcium oxalate crystals are deposited in urine after standing. This salt is largely held in solution by the acid phosphate of sodium, the amount of this substance varying with the diet. Where large amounts of food are taken and the metabolism is increased, the amount of calcium oxalate may be increased. In certain acid irritations in the genito-urinary tract, calcium oxalate may be increased in amount and the crystals deposited, sometimes forming calculi. They are particularly liable to form the nucleus of deposits of urates and phosphates.

The daily output of oxalic acid is normally about 10 mg., depending on the kind of food ingested, although a small amount of this acid may be excreted on an absolutely oxalate-free diet. When large amounts of this acid are excreted for some time, certain nervous symptoms are likely to be present, as occurs in neurasthenia and hypochondriasis.

Deposits of calcium oxalate may occur in the pelvis of the kidney and irritate the ureter and cause bleeding, as they are likely to be of irregular contour.

Oxalic acid may come directly from the food, may be produced from foodstuff in the body, or may occur in small amounts from some metabolism of the body

1. Haskins: Jour. Biol. Chem., 1916, xxvi, 205.

tissues. While certain vegetable substances are probably most frequently the source of oxalic acid, such as rhubarb and spinach, it has been shown that oxalic acid may come from gastric fermentation of carbohydrates.[2] Proteins do not seem to cause the production of oxalic acid,[3] so that probably most of the calcium oxalate in urine comes more or less directly from preformed oxalic acid in the food. Consequently, the amount of calcium oxalate may be reduced to a minimum by a careful selection of the diet.

When calcium oxalate crystals are found in any amount in the urine, especially if the urine has not been standing long, preventive treatment of such deposits is essential. Although the danger of the formation of calculi is probably small, prevention by arranging the diet is so simple that this precaution should be taken. Besides the arrangement of the diet and the drinking of more pure water, the bowels should be regulated. The foods to be avoided, besides spinach and rhubarb, are cranberries, asparagus, radishes, horseradish, and many of the acid fruits, as grapes, currants and persimmons. Medicinal treatment should consist in the administration of acid sodium phosphate or some alkali, as sodium or potassium citrate.

URIC ACID

Uric acid is an end-product of nucleoprotein metabolism. The amount excreted in the urine varies from 0.4 to 1 gm. a day, and on a purin-free diet the normal individual excretes by the urine about the same amount of uric acid daily, that is, endogenous uric acid, or that which comes from systemic metabolism. Above 0.6 gm. of endogenous uric acid is considered a large amount. Between 1 and 2 per cent. of the total nitrogen of the urine comes from uric acid. In gout the uric acid may vary — it may be decreased, or, after an acute attack, it may be increased. A patient suffering from gout, given a known amount of purin-containing foods, will often excrete this exogenous uric acid more slowly than a normal patient; normally the whole of such exogenous uric acid is excreted in forty-eight hours. Patients with gout have shown more uric acid in the blood than normal persons, but this has also been found in other conditions. Uric acid in the blood is mostly in the form of monosodium urate. The amount of uric acid is increased in leukemia, whenever there is a breakdown of the white cells, when there is absorption of any blood or white cell exudate, and after active muscular exercise.

An increased amount of uric acid in the blood, so-called uricacidemia, is therefore found in most cases of gout, in severe nephritis, in leukemia, in resolving exudates such as pneumonia, in wasting diseases, and after Roentgen treatment, especially when the long bones or spleen are rayed.

Before it is decided that the uric acid output is increased, a twenty-four hour specimen of the urine should be examined, the patient continuing his regular diet and taking no drug. If it is found that the uric acid output is increased and there are uric acid and urate deposits, the treatment should be the same as that described for hyperacidity. The purins, such as meats, coffee and tea, should be removed from the diet, temporarily, at least.

The theory often advanced that an increased uric acid production is due to suboxidation is not tenable.[4]

The retention of uric acid seems to be of more interest than an increased excretion. That at times the uric acid excretion is retarded and uric acid derivatives or by-products can be stored in the body in the joints seems unquestionable. That symptoms such as headache, indigestion, imperfect liver activity (perhaps an imperfect detoxication of toxins, or other absorbed products), constipation, myalgias, and joint pains may follow or accompany such retention seems to be a fact. The term "uricacidemia" should not be used too frequently, as uric acid is probably not frequently increased in the blood. An increased production and increased output of uric acid, or, in certain individuals, an increased production and retention of uric acid may at times be caused by drinking alcohol with a meat and purin meal, the alcohol causing a disturbance of the liver function and a greater mobilization of uric acid. Anything that removes this retained uric acid or limits the production will remove the symptoms described above.

Uric acid mistakes are not gout, and gout is not caused by uric acid malmetabolism. On the other hand, there is no question that in gout the uric acid metabolism is disturbed, that the metabolism of purins is often abnormal, that uric acid may be increased in amount, and that frequent attacks of uric acid retention occur in the general disturbance termed gout. Acute gout can occur without apparent retention of uric acid.

In uric acid retention there should be an elimination of meat purins, alcohol, and tea or coffee from the diet, and an increase in the amount of pure water consumed. Tobacco should be prohibited, or at least the amount used should be greatly diminished.

Salicylic acid will generally increase the uric acid excretion; alkalies may have the same effect. There is no good physiologic reason for administering lithium in any form, and the only value that lithium waters may have is due to the bulk of water drunk. Colchicum is not as valuable as a salicylate preparation, and its only value consists in a dosage sufficient to cause purging. Atophan (phenyl-quinolin-carboxylic acid) increases greatly the elimination of endogenous uric acid, both in persons suffering from gout and in normal persons. This increased elimination soon diminishes.

It has not been shown that uric acid causes a high blood pressure, although the intestinal disturbance accompanying uric acid retention may often allow resorption of intestinal substances which will raise the blood pressure. In gout also the blood pressure may be high, and there may be an increased suprarenal secretion. Some as yet unknown disturbance of internal secretion may be the cause of the apparently noninfectious chronic disturbance of metabolism which is termed gout. In the acute form of this disease, there may be nitrogen retention in the blood which will raise the blood pressure.

(To be continued)

2. Baldwin: Jour. Exper. Med., 1900, v, 27.
3. Wegrzynowski: Ztschr. f. physiol. Chem., 1913, lxxxiii, 112.
4. Goodridge, F. G., and Foster, N. B.: The Relation of Uricolysis to Suboxidation, Arch. Int. Med., December, 1912, p. 585.

A Vacation Hint.—At the request of the Panama Canal authorities, Gatun Lake has been stocked with fish by the United States Bureau of Fisheries. According to the report of Julius D. Dreher, consul at Colon (*Commerce Reports*, December 1), large numbers of rock bass, black bass, catfish and sunfish have been released in the lake to determine whether they will thrive in these tropical waters. If the experiment succeeds it is said that the lake may furnish a considerable part of the demand for fresh fish in the Canal Zone.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 23, 1916

"Blow, bugles of battle, the marches of peace;
East, west, north and south let the long quarrel cease;
Sing the song of great joy that the angels began,
Sing of glory to God and of good-will to man!"

To Our Readers: A Merry Christmas and A Happy and Prosperous New Year

THE RED BLOOD CORPUSCLES—ARE THEY DISK-SHAPED OR BELL-SHAPED?

The classic description of the red blood corpuscles, or erythrocytes, of man and mammals refers to them as minute circular disks with biconcave surfaces and rounded or convex edges. These cells apparently exist within the blood, floating in the plasma, in a state of osmotic stability; that is, the plasma is an isotonic solution in relation to the red corpuscles. From time to time one hears of the bell-shaped or cup-shaped red corpuscles in mammalian blood; and the contention has now and then been made that this is in fact the normal or natural form of the blood cell and represents the type which actually circulates in the intact blood stream. This is the conclusion derived from statements of Weidenreich[1] and of Lewis.[1] It has been claimed that blood examined immediately after withdrawal on a warm slide is favorable for the demonstration of cups. According to this view, the assumption of the familiar disk-shape depends on an almost instantaneous change due to the evaporation and concentration of plasma before the preparation can be made and examined.

Cup-shaped erythrocytes can unquestionably be found in microscopic preparations of the blood under certain conditions.[2] The problem narrows itself to the inquiry as to which of the two known forms actually represents the true or normal shape of these formed blood elements. Jordan has presented evidence in refutation of the new teaching that the normal shape of the mammalian red blood corpuscles is cup-form.[2] This evidence includes data derived from an examination of the capillaries in the omentum of an anesthetized animal, sections of variously fixed tissues, and hanging drop preparations of fresh blood. The latter, sealed and kept at body temperature, were thought to simulate closely actual conditions in the blood vessels of the living animal. The free central corpuscles of such a drop preparation are almost exclusively of the circular biconcave disk form. In view of all the evidence there seemed to be no escape from the conclusion that the biconcave disk-shape is the normal, the cup-shape the derived, form of the mammalian erythroplastid.

More recently Arey,[3] of the Northwestern University Medical School in Chicago, has added further proofs of the correctness of this assumption by examining human blood collected for microscopic examination directly into human serum instead of any "foreign" diluent or fixative. If evaporation and temperature changes are prevented, such preparations are stated to show usually a few cups, whereas quantities of disks are seen in every field inspected. In diluted serum, however, typical cups may be found in large numbers. Since the form of a corpuscle thus depends on the concentration of its medium, how, asks Arey, can the cup-shape be normal when human serum must be diluted to produce this type?

The blood vessel of a living animal ought to offer a theoretically more favorable condition for the observation of the natural form of the corpuscles. It has been objected that pressure caused in the manipulation of tissues, like the mesentery, which are suitable for microscopic observation in life, might alter the normal shapes. Arey has succeeded in averting this alleged difficulty. The erythrocytes were nevertheless almost all of the disk-shaped type. When anesthetics are employed, however, cup-shapes may be found in abundance; they may also be produced in microscopic preparations by treatment with traces of volatile substances like ether and chloroform. They represent the abnormal; and it is easy to conceive that the delicately constructed and highly flexible erythrocytes should be subject to ready distortion through the action of reagents.

Arey admits that a limited number of cup-shaped erythrocytes undoubtedly exist in normal blood. Possibly they represent corpuscles whose structure is such that unequal tensions with respect to the osmotic balance exist; perhaps they are old (or young?) corpuscles. In anemias the presence of many cups has been reported, and in fevers it is said crenation may

1. Weidenreich, F.: Arch. f. mik. Anat., 1902, lxi, 459; Ergebn. d. Anat. u. Entwicklungsgeschichte, 1910, xiii, 1. Lewis, F. T.: Jour. Med. Research, 1904, x, 513.

2. Jordan, H. E.: Anat. Anz., 1909, xxxiv, 16; The Shape of the Human Red Blood Corpuscle, Proc. Soc. Exper. Biol. and Med., 1915, xii, 167.

3. Arey, L. B.: The Mammalian Erythrocyte — a Biconcave Disk, Science, 1916, xliv, 392.

occur. Thus the evidence now available from the examination of drawn blood, diluted in human serum, and from the study of circulating blood in non-anesthetized living mammals justifies, in Arey's belief, the conclusion that the biconcave disk represents the normal shape of the mammalian erythrocyte — the concavo-convex cup being merely an occasional modification.

LEGAL STATUS OF THE ASSOCIATION SUSTAINED

Many of our readers will recall that, at the time of the St. Louis session of the Association in 1910, it was rumored that an injunction would be served on the members of the House of Delegates to prevent the election of officers, on the ground that such election was illegal when held outside of the state of Illinois. No injunction was served, and the election proceeded as usual. During the later months of the year, efforts were made to induce the state's attorney for Cook County to start a "quo warranto" suit against the Association, on the ground that the law was being violated by the holding of the annual meetings and the election of officers outside of Illinois. This the state's attorney refused to do, holding that the Illinois law did not require corporations not for profit to hold their annual meetings and elections in the state and that there was, therefore, no justification for such a suit. The attorney general of the state was then asked to take up the matter, but he also refused to authorize a suit. Jan. 5, 1911, a petition was filed in the circuit court of Cook County against the state's attorney, asking that he be compelled to bring suit against the trustees of the Association. From this time until Dec. 20, 1915, nearly five years, the issue was between the parties asking for the injunction and the state's attorney of Cook County, the point at issue being whether the state's attorney could be compelled to initiate such a suit against his judgment.

Various statements regarding the progress of the case have appeared in THE JOURNAL from time to time.[1] The matter went to the appellate court twice and finally to the supreme court of Illinois, which, Dec. 20, 1915, just a year ago, refused to hear arguments on the merits of the case and ordered the circuit court to take up the original question, namely, whether or not corporations not for profit incorporated in Illinois were compelled under the law to hold their meetings in the state. Here for the first time the American Medical Association, technically, came into the case. The matter was argued last week before Judge Heard, who, on Saturday, December 16, rendered a decision which appears elsewhere in this issue of THE JOURNAL.[2] The legal situation is that the attorneys for the Association filed a demurrer (that is, argued that even if all the statements made by the plaintiff were true, there would still remain no ground for action), in which they claimed that, under the Illinois law, corporations not for profit, such as the American Medical Association, were not required to elect officers or hold their annual meetings in the state, but could meet wherever they saw fit. This position Judge Heard sustained, implying in his ruling that it is in the interest of public policy that organizations, such as the American Medical Association, the American Bar Association and other similar national bodies, should be allowed the largest liberty in carrying on their activities. Such restrictions as are necessarily applied to commercial corporations organized for profit could work no good, but rather harm, if they were applied to such associations.

Let it again be emphasized that the questions at issue in this suit have no specific application to the American Medical Association; that is, they apply to all other organizations similarly incorporated under the laws of Illinois. The point at issue is the purely legal question whether or not the Illinois laws require corporations not for financial profit to hold their annual meetings and elect officers within the state. No injury could possibly result to any individual through the Association holding its meetings and electing its officers in other states than Illinois; it is conceivable, however, that injury might result to the best interests of the Association itself were it compelled to hold all its meetings in one state.

1. The Alleged Decision Against the American Medical Association, Current Comment, THE JOURNAL A. M. A., Nov. 22, 1913, p. 1906; Association News, ibid., p. 1920. The Incorporation of the American Medical Association, Current Comment, Dec. 25, 1915, p. 2247. Quo Warranto Proceedings Against the Association, July 1, 1916, p. 42.

2. Court Rules Corporations Not for Profit May Elect Trustees or Directors Outside of State, THE JOURNAL A. M. A., this issue, p. 1962.

A POSSIBLE SOURCE OF FOOD-POISONING BACTERIA

Within recent years the bacillary white diarrhea of young chicks has assumed an unanticipated prominence among poultry scourges. It is caused by a specific organism, *Bacterium pullorum*, and is transmitted directly from the mother hen to the chick, through the infected egg. This newly emphasized disease of the domestic animals presents a somewhat exceptional type of carrier problem.[1] The hen which has acquired the infection with the organism either early in her existence, or after full maturity, becomes a permanent source of danger to the species. It has now been clearly demonstrated that the permanent seat of infection is the ovary, which in many instances becomes so greatly involved that the ova are discolored and misshapen, and the ovary presents a decidedly pathologic appearance. The ova harbor the disease organism. Furthermore, ova which develop into apparently normal yolks frequently carry the organism, *Bacterium pullorum*, to the time of full formation of the egg.

1. Rettger, L. F., and Stoneburn, F. H.: Bull. Storrs Agricultural Experiment Station, 1909, No. 60; 1911, No. 68; Rettger, L. F.; Kirkpatrick, W. F., and Stoneburn, F. H.: 1912, No. 74; Rettger, L. F.; Kirkpatrick, W. F., and Jones, R. E.: 1914, No. 77.

Infected eggs produce infected chicks, and although chicks succumb frequently before their embryonic development is completed, a large percentage emerge from the shell apparently sound and well. However, they soon acquire the disease and many of them fall a prey to the organism which they carried for a long time in their yolk. Those which survive often become permanent bacillus carriers, and thus the cycle of infection is completed. Furthermore, these chicks are a constant source of infection to other chicks and mature stock as well.

Some idea of the magnitude of the distribution of the organism involved in this infection can be gained from the statistics collected in a campaign put into operation by the Connecticut Storrs Agricultural Experiment Station to eradicate the disease.[2] In a single year out of nearly 14,000 hens examined in the state, 1,417, or over 10 per cent., gave evidence by macroscopic agglutination tests of being carriers of the *B. pullorum*. Obviously this ovarian infection of fowls is somewhat common throughout this country. Hence a large proportion of the marketed eggs are infected with *Bacterium pullorum*. When such eggs are allowed to remain in nests under broody hens, or in warm storage places, for comparatively few hours, they contain large numbers of the organism.

One naturally asks whether micro-organisms known to afford a severe menace to the life of young chicks render infected eggs unsafe as an article of diet for man, and especially for young children and infants. Experiments conducted in the laboratories of Yale University by Rettger, Hull and Sturges[3] have shown that eggs which harbor *Bacterium pullorum* in the yolk in large numbers may produce abnormal conditions, when fed, not only in young chicks, but in adult fowls, young rabbits, guinea-pigs and kittens. The toxicity for young rabbits is most pronounced, the infection usually resulting in the death of the animals. In kittens the most prominent symptoms are those of severe food-poisoning with members of the paratyphoid group of bacteria.

Eggs for human consumption are usually served after some sort of cooking procedure, though this is by no means always the case. Can the treatment with heat in the kitchen be depended on to destroy the micro-organism in question? The Yale tests indicate that the common methods of boiling or frying infected eggs for the table do not necessarily render the eggs sterile, so far as *Bacterium pullorum* is concerned. It was found that soft boiling, coddling, and frying on one side only do not necessarily render the yolks free from viable bacteria; therefore, eggs which have gone through these processes may, like raw eggs, be the cause of serious disturbances in persons who are particularly susceptible to such influences, and especially to infants.

In view of this report, the possibility of including the *B. pullorum* among the so-called "food-poisoning micro-organisms" must be taken into consideration. A bacteriologist may be pardoned if he is always "looking for trouble." Experience has fortified him in the appreciation of such quests. Rettger, Hull and Sturges present the situation without undue exaggeration as follows:

> That no well authenticated instances of egg-poisoning of this kind are on record does not warrant the assumption that there have been no cases. The etiology of infantile stomach and intestinal disturbances is as yet too little understood; in fact, it may be said that many of these disorders have no known cause, and almost as much may be said regarding gastro-intestinal diseases in later life. Furthermore, since the ailments caused by infected eggs would not make themselves felt presumably until several days after their ingestion, little or no suspicion would fall on the eggs. It may be said, too, that the wide distribution of ovarian infection in the domestic fowl has come about only in the last few years, hence its possible danger to man is one of recent development.

2. Rettger, L. F.; Kirkpatrick, W. F., and Jones, R. E.: Bacillary White Diarrhea of Young Chicks: Its Eradication by the Elimination of Infected Breeding Stock, Bull. Storrs Agricultural Experiment Station, 1915, No. 85.

3. Rettger, L. F.; Hull, T. G., and Sturges, W. S.: Feeding Experiments with Bacterium Pullorum. The Toxicity of Infected Eggs, Jour. Exper. Med., 1916, xxiii, 475.

THE EPIDEMIOLOGY OF LOBAR PNEUMONIA

Now that the death rate from pneumonia has overtaken that of tuberculosis, pneumonia has become the most serious and fatal of the acute infectious diseases. This alone is sufficient to direct attention to the problem of combating it, since it has shown little tendency recently to a spontaneous decrease in its morbidity. Although its dependence on bacteria was clearly suspected long before the true etiologic agents were ascertained, the discovery of the actual cause was made doubly difficult owing to the abundant bacterial flora found in the upper respiratory passages even in healthy persons. In speaking of the swarm of applicants for the honor of discovering the cause of pneumonia, a popular writer has remarked that at one time "almost every self-respecting bacteriologist seemed to think it his duty to discover at least one real criminal germ." An added complication has been introduced by the now recognized possible participation of more than one variety of micro-organism in the genesis of pneumonias.

The ultimate victory over great scourges has almost always rested with preventive medicine rather than with therapeutics. Stillman[1] has presented the situation clearly by remarking that scientific investigation of pneumonia has dealt largely with methods of therapy, and little or no effort has been expended in the elaboration of means of prevention. Recently, the study of the bacteriology of lobar pneumonia has developed new facts which make it advisable to study the epidemiology of the disease, in the hope that such

1. Stillman, E. G.: A Contribution to the Epidemiology of Lobar Pneumonia, Jour. Exper. Med., Dec. 1, 1916, xxiv, 651.

investigation may reveal important factors concerned in its transmission.

Pneumococci are present in the mouths of nearly two out of three normal persons; but the organisms present are now clearly distinguishable from the highly parasitic types of pneumococcus which cause the severe forms of lobar penumonia. This disease is due in 65 per cent. of cases to specific types of pneumococci possessed of high pathogenicity, which do not occur in the buccal secretions of normal persons, except in instances in which there has been intimate association with persons suffering from the disease.

The organisms found in normal mouths occasion not more than a relatively small percentage of the total cases of lobar pneumonia. It is highly important to realize, however, that healthy persons who have been in contact with patients having the disease not infrequently carry in their mouth organisms of the same type as that causing the infection.[2] The carrier problem is thus promptly presented. For example, from a total of forty-one cases of lobar pneumonia due to severe types of pneumococci in which the patients were examined at the Hospital of the Rockefeller Institute, five gave rise to a carrier condition in at least one of the immediate associates of the patients. Six per cent. of the eighty-four contacts examined showed the virulent pneumococci in their sputum. Stillman concludes, therefore, that the occurrence of this type of the etiologic micro-organisms in the mouths of persons associated with lobar pneumonia patients is to be expected. It seems logical that infection with the virulent types must be regarded as dependent on contact with a previous case of lobar pneumonia due to the same type of organism. These types of infection are acquired either by direct contact with an active case of pneumonia or by association with a healthy carrier of one of these now recognizable types of pneumococcus or with a convalescent from lobar pneumonia who still harbors in his mouth secretions the organism responsible for the disease. It should be recognized that such convalescents may for a considerable period of time carry the virulent organism with which they were infected. Infection with the familiar nonvirulent sputum types of pneumococci may be autogenic in character or due to the acquisition by the individual of a given race of one of these types to which he is especially susceptible.

2. Dochez, A. R., and Avery, O. T.: Jour. Exper. Med., 1915, xxii, 105.

The "Popular" Surgeon and the Hospital.—A surgeon whose private practice is so large as to exhaust his time and energy cannot be expected to be punctual in his attendance on the wards, or to be deliberate, careful and thorough in examining ward patients. This is the type of surgeon who sees his patients for the first time in the operating room, and who is content to leave diagnosis and other preliminaries in the hands of the house staff. Such a surgeon may be entirely willing to give his best service to the hospital, but he is not in a position to do so.—S. S. Goldwater, M.D., *Modern Hospital*, November, 1916.

Current Comment

SOME RULINGS ON THE HARRISON LAW

In a recent discussion on the Harrison Narcotic Law, Mr. Kane,[1] considering the law from the standpoint of the federal prosecuting attorney, pointed out that the Federal Court of the Southern District of Ohio held that the phrase "in the course of his professional practice only" limited the physician to the prescription of opium and cocain to "legitimate and professional" uses. The Federal Court of the Northern District of New York held that prescribing these drugs in an amount so large as to be unreasonable is a violation of the law, and that the druggist filling such a prescription is also guilty. In Virginia, the judge held that prescribing was the same as selling or dispensing, and that a prescription is not a protection to a druggist, unless it is for legitimate purposes. Mr. Kane suggested that the law should be so amended as to exempt specifically morphin addicts suffering from chronic or incurable diseases and to allow physicians to furnish such patients with necessary drugs, provided each case be reported to the state board of health. He also thought that the sale of hypodermic syringes should be restricted by amendment to the law. The medical discussion centered largely around the question of immediate or gradual withdrawal of the drug. The Philadelphia County Medical Society is wisely considering this question with a view to participating in the formulation of a state law to supplement the Harrison act. The time to influence legislation is before bills are drafted, and not after they are introduced. If our county and state medical societies will give careful and judicial consideration to the regulation of the use of habit-forming drugs by adequate state laws, and will secure the insertion of proper provisions while the bills are in a formative stage, much embarrassment and difficulty may be spared physicians in the future.

POISONOUS PROPERTIES OF THE MARSH MARIGOLD

The marsh marigold (*Caltha palustris*), which brightens our northern marshes and stream banks with its yellow flowers and dark green foliage in early spring, generally before the snow has entirely melted, is familiar to most of us. The stems and leaves are extensively gathered in early spring and cooked for greens, making one of the best pot herbs. The plant belongs to the Ranunculaceae or crowfoot family. Statements in the literature concerning the poisonous properties of the marsh marigold are confusing. Some writers state that it is poisonous in a green state, but that its poisonous principles are dissipated by heat; others that it contains an alkaloid identical with nicotin, though this has been disputed; a few that it contains an acrid substance identical with the oil of ranunculus; still others that if fed to stock with hay it causes diarrhea and stoppage of the flow of milk. A

1. Kane, F. F.: The Legal Aspect of the Drug Habit Problem, abstr., THE JOURNAL A. M. A., this issue, p. 1964.

recent investigation of the fresh plant by Poulsson[1] shows the presence of anemonin, already known in many other members of the crowfoot family, and of cholin. Anemonin is a camphor-like, poisonous substance, having the formula $C_{15}H_{12}O_6$. It was evidently the volatile, mildly toxic base cholin which in earlier examinations was mistaken for nicotin. Alkaloids were not found. From the results of the chemical investigation as well as from past experience in the use of the plant, it is evident that there is little danger in using the marsh marigold for greens, at least if precautions are taken to insure its thorough cooking.

THE RELATION OF ALCOHOL TO MORTALITY

We have received a bulletin issued by the anti-prohibition interests commenting on the fall of the death rate during the past five years, and noting that during the same period the sale of liquors has greatly increased. It concludes:

> Sane people who are honest with themselves will draw the conclusion that the nation is going along under constantly improving conditions of sanitation and sobriety, and while using liquors more freely, it is using but not abusing.

The circular then goes on to discuss the death rate among the colored race, which is higher, and states that it is undoubtedly due to their "wretched habitations." It says finally:

> Every statement and all the figures . . . tend to refute the prohibition asseveration that the increased use of liquor is the cause of increased mortality.

Statistics or the figures themselves never lie; but compared with some of the interpretations which are made from them by the advocates of personal liberty in drinking, Baron Munchausen was a second George Washington.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Personal.—Dr. Mary Lawson Neff, Phoenix, delivered an address at the last meeting of the state bar association on "The Relation Between Mental Defectives and Crime."——Dr. Alfred G. Murrieta has resigned as chief of staff at the United Verde Mining Company's hospital, Jerome.

Journals Consolidated.—The *Arizona Medical Journal*, and the *New Mexico State Journal of Medicine* and the *El Paso Medical Bulletin* are to be merged in a new publication to be published in El Paso under the name of *Southwestern Medicine*. The state medical societies of Arizona and New Mexico and the El Paso County Medical Society finance the new publication. This will be the official organ of the El Paso Medical Society and of the Southwestern Medical and Surgical Association.

CALIFORNIA

Clinic Building Presented.—Mr. F. O. Johnson, Los Angeles, has presented the board of education with a deed to the free clinic building erected by his father, C. T. Johnson, at a cost of $45,000. During the six years of the existence of this clinic, 100,000 patients have been treated in its various departments.

Personal.—Dr. Samuel A. Silk, Duarte, has accepted a position on the staff of St. Elizabeth's Hospital, Washington, D. C.——Dr. May Elizabeth Walker, Oakland, has been appointed resident surgeon in the Royal Infirmary for Sick Children, Edinburgh.——Dr. John P. Gilmer has succeeded Dr. Edwin H. Wiley as police surgeon of Los Angeles and has appointed as his assistants Drs. Clayton G. Stadfield, George A. Zorb, Byron P. Stookey and Karl L. Dieterle.——Drs. Howard J. Wright, San Francisco, and Fred Cozelman, Los Angeles, have been appointed members of the medical staff of the Stockton State Hospital.—Dr. Fred W. Hatch, Sacramento, general superintendent of state hospitals, has been reappointed for a term of four years.

Tuberculosis Conference.—The San Francisco Association for the Study and Prevention of Tuberculosis will hold a joint, all-day conference with state organizations at San Francisco, Jan. 25, 1917. The phases of the campaign to be discussed include "The Tuberculosis Bureau of the Board of Health," "The Clinic and Tuberculosis," "The Open Air School," "The Importance of the Visiting Nurse in the Campaign," "Physical Examination of Employees," "Health Insurance and Relation to the Control of Tuberculosis" and "The Need of the Country Sanitarium for San Francisco." Features of the day are to be the round table discussions at the luncheon and the annual dinner. The public is invited to attend the meeting.

DISTRICT OF COLUMBIA

Birth Control.—The Birth Control League of the District of Columbia has authorized its executive committee to take action looking toward the introduction into Congress of a bill to legalize birth control in the District.

Conviction Under the Harrison Narcotic Act.—In the Supreme Court of the District of Columbia, December 15, Thurman Burck, alias the "Baltimore Kid," was sentenced to the penitentiary for three years for violation of the Harrison Narcotic Act. In imposing sentence Justice McCoy gave warning that future offenders should expect no leniency.

Oppose Location of Municipal Hospital.—Organizations of citizens residing in the vicinity of the site purchased by the government about sixteen years ago for a municipal hospital have renewed their fight against its use for that purpose. The matter assumes definite shape just now because of the recommendation of the board of charities and of the board of commissioners that an appropriation be made for carrying out the project, which must be acted on at the present session of Congress.

ILLINOIS

Certificate for Infants of Record.—The Illinois State Board of Health has arranged to send to the mother of each child in the state whose birth is recorded an engraved certificate of birth, and also a copy of a booklet entitled, "Our Babies: How to Keep Them Well and Happy."

The Year at Cook County Hospital.—During the last year, according to the report of Warden Clayton F. Smith, 81,102 patients were handled at the Cook County Hospital; 31,261 were admitted as bed patients and were under treatment; 17,806 had wounds or injuries treated, and were then released; 4,750 applied for and were given medicine; 24,177 persons asked for admission and were rejected; 1,384 patients had Roentgen-ray examinations, and there were, on December 1, 1,724 patients in the hospital.

New Officers.—At the forty-third annual meeting of the North Central Illinois Medical Association, held in Pontiac, December 6, the following officers were elected; president, Dr. Fred W. Wilcox, Minonk; vice presidents, Drs. David S. Conley, Streator, and Otho B. Will, Peoria, and secretary-treasurer, Dr. George A. Dicus, Streator (reelected).——The thirteenth annual meeting of the Iroquois-Ford Counties Medical Society was held at Watseka, December 5, and the following officers were elected: president, Dr. Omar O. Hall, Milford; vice president, Dr. Frank B. Lovell, Gibson City, and secretary-treasurer, Dr. Spencer S. Fuller, Paxton.

Personal.—Dr. Frank M. Barker, Waukegan, was operated on for appendicitis, December 12.——Dr. Gideon H. Hoffman has been elected president; Dr. Peter J. McDermott, vice president, and Dr. Ira M. Miller, secretary-treasurer, of the Kewanee Physicians' Club.——Dr. Hugh Q. Allison, Grayville, who has been ill with pneumonia in a hospital in Olney, is convalescent.——Dr. Jacob I. Krebbs, Polo, is under treatment at a sanatorium in Freeport.——Dr. John H. Rice, Quincy, who recently underwent operation in Cleveland, is improving.——Dr. Charles A. Alden was elected president

1. Poulsson: Tidsskrift for kemi, farmaci og terapi; through Schweiz. apoth. Ztg., 1916, liv, 578.

and Mrs. J. F. Percy, vice president of the newly organized Galesburg Chapter of the American National Red Cross.

Chicago

Kingsley Resigns.—Mr. Sherman C. Kingsley announces his resignation from the directorship of the Elizabeth McCormick Memorial Fund, to become executive officer of the Cleveland (Ohio) Welfare Federation. He will assume his new duties January 15.

Personal.—Dr. Ralph Henry Kuhns, who has been for eight months one of the surgeons at the base hospital in Deutsch-Eylau, Germany, is returning to spend the holidays at home. ——Dr. John L. Porter conducted an orthopedic clinic at the Blodgett Memorial Hospital, Grand Rapids, December 6.

Robert Koch Society.—The twenty-fourth meeting of the Robert Koch Society for the Study of Tuberculosis was held at the Hotel Morrison, December 21. Dr. Roswell T. Pettit, Ottawa, spoke on "The Importance of Mixed Infection and Pulmonary Tuberculosis," the discussion being led by Dr. James L. Anderson of the Chicago Winfield Sanatorium.

Fenger Memorial Fund.—The directors of the Fenger Memorial Fund announce that the sum of $500 has been set aside for investigations in medicine or surgery in 1917. The money will be used to pay all or part of the salary of a worker, the work to be done under direction in an established institution, which will furnish the necessary facilities and supplies free of cost. It is desirable that the work undertaken should have a direct clinical bearing. Applications giving full particulars should be sent to L. Hektoen, 629 South Wood Street, Chicago, before Jan. 15, 1917.

The Venereally Diseased.—A dinner discussion under the joint auspices of the Central States Division of the Social Hygiene Association of the Chicago Woman's Club and Woman's City Club, and the committee on vice conditions of the City Club of Chicago, was held at the City Club, December 14, under the presidency of Dr. William T. Belfield. Subjects discussed were, "What a City of the Size and Character of Chicago Should Do for Venereally Diseased," by Dr. William A. Pusey; "What the Chicago Health Department is Doing for the Venereally Diseased," by Dr. Frederick O. Tonney; a discussion on "The Status of Chicago's Hospital and Clinical Facilities for Diagnosis and Treatment of Venereal Disease" led by Drs. B. Newton Novy, Oliver S. Ormsby and Lewis Wine Bremerman, and a general discussion of the topic by Drs. B. Newton Novy, Anna Blount, Rachelle S. Yarros and others.

INDIANA

Health Survey at South Bend.—Surgeon Carroll Fox, U. S. P. H. S., is in charge of a sanitary survey of South Bend, for which $2,000 has been appropriated by the city council. Dr. Fox was the guest of honor at a dinner given by Dr. Charles S. Bosenbury, city health officer, at the Indiana Club House, November 29.

Personal.—Dr. Frank C. Robinson, Martinsville, has been commissioned major in the Medical Corps and assigned to duty with the First Indiana Infantry at Llano Grande, Texas, succeeding Major Frank W. Foxworthy (resigned).——The office of Dr. J. W. Henry Ranke, Fort Wayne, was seriously damaged by fire, December 11.—Dr. Clarence P. Hinchman, Indianapolis, has been seriously ill with diphtheria.

Medical School Damaged by Fire.—December 7, the building of the Indiana University School of Medicine, Indianapolis, caught fire, resulting in the total loss of the laboratories located on the third and fourth floors, with a damage estimated at $35,000. Classes are being held at the Shortridge High School and the Indiana Dental College temporarily, and arrangements are being made for the construction of a new building which will probably be located on the grounds of the Robert Long Hospital.

School Inspection to be Extended.—At the meeting of the Indiana Township Trustees in Indianapolis, December 7, Dr. William F. King, Indianapolis, assistant state health commissioner, announced that the next legislature will be asked to make school inspection compulsory in every township, and to establish a department of school hygiene under supervision of the state superintendent's department. Dr. King declared that 90 to 95 per cent. of the children of school age in Indiana are physically defective, including those with bad teeth.

Problems of Mental Defectives.—The commission appointed by Governor Ralston more than a year ago to study the problem of mental defectiveness in the state has completed its work. It states that at least one thousand insane persons are deprived of proper treatment on account of a lack of accommodations in the hospitals, and makes the following recommendations: the addition of new buildings to the hospitals, using the farm colony system as a model; additional provisions for care of women at the village of epileptics; enlargement of the village of epileptics to accommodate 1,200 patients. Its capacity at present is only 305; a department for treatment and observation of incipient mental cases should be established at the Robert Long Hospital; all general hospitals in the state should maintain wards for detention and observation pending commitment and admission to a state insane hospital; no person suffering from mental disease should be placed in a jail; there should be a law providing for voluntary admission to insane hospitals; the school for feebleminded youth at Fort Wayne should be enlarged by a colony in the southern part of the state on not fewer than 1,000 acres of land, with inexpensive buildings; the law should provide for commitment of patients to the school for feebleminded youth and for admission of feebleminded male adults the same as female adults; there should be a mental examination of schoolchildren, and separate schools or rooms should be provided for the mentally defective pupils.

IOWA

Personal.—Dr. Henry Matthey, Davenport, who recently returned after service in German war hospitals, has been unanimously elected an honorary member of the Kriegerverein.——Dr. Joseph G. Henderson, West Chester, was thrown from his car recently and suffered a fracture of the arm at the elbow.——Dr. James S. Gaumer, Fairfield, has returned from service with the Iowa troops on the southern frontier and resumed practice.

Housing Supervision.—The supervision of housing conditions in cities of the state is recommended by Dr. Guilford H. Sumner, secretary of the state board of health, in his annual report. A measure is to be introduced during the coming session of the legislature which will give cities the power to inspect tenement houses, dwellings and other structures with a view of making them sanitary and healthy dwelling places. Dr. Sumner also recommends the adoption of a vital statistics law; an increase in appropriations for the state board of health from $5,000 to $15,000; prohibition of the pollution of streams; the adoption of a schoolhouse building law; the adoption of a law providing for the medical inspection of children; the adoption of a morbidity law providing for the reporting of diseases, and provision of a health car for the proper carrying on of a sanitary campaign in the state.

MARYLAND

Give Ambulance for France.—Through the generosity of Dr. and Mrs. Hugh Hampton Young, an ambulance will be equipped and sent forward to France as soon as possible. The inspiration for this gift came through a lecture given recently by Leslie Buswell, of the American Ambulance Corps, who made an eloquent appeal for an ambulance.

Isolation Hospital Closed.—The Children's Hospital School, Baltimore, has been closed as a place for the isolation of children afflicted with infantile paralysis, and five of the eight remaining victims of the disease have been returned to their homes. The others, who have not yet sufficiently recovered, will be sent to Sydenham, the city's hospital for infectious and contagious diseases. The contract which the city made with the directors of the Children's Hospital School expired, December 1, and was extended for two weeks.

Personal.—Major J. Harry Ullrich, M. C., Field Hospital No. 1, who recently returned from Eagle Pass, Texas, on furlough, was seriously injured a few hours after he arrived in Baltimore, when he was struck by a crank handle while starting his automobile. The cheek bone was depressed, and he received a severe cut across the eye. It was feared at first that his eye had been crushed, but it is now believed that it is not permanently injured.——Dr. William Royal Stokes, bacteriologist of the city health department, is ill at his home with influenza.——Dr. Alan C. Woods, secretary to Dr. John D. Blake, commissioner of health, is ill at his home.——Dr. Harry L. Kolseth has been appointed one of the health wardens of Baltimore, to succeed Dr. J. H. Von Dreele, who resigned several months ago.——Dr. Simon Flexner of the Rockefeller Institute for Scientific Research, at the request of the Women's Civic League and the Johns Hopkins University, spoke on infantile paralysis at a public meeting in Baltimore, December 13.

Sanatoriums for Negroes Proposed.—United States Senator John Walter Smith has launched a movement to have the state make some provision for the care and cure of the thousands of tuberculous colored people in Maryland. Senator Smith, to whom is mainly due the establishment of the state sanatorium at Sabillasville, strongly urged that, in the interest of both races, the state should take prompt steps to care for the colored tuberculous victims, and he will try to have the next legislature make an appropriation for this purpose. The Sabillasville sanatorium was established exclusively for white patients and has been in operation nearly ten years. Its work has been helpful to thousands, and the taxpayers have cheerfully supported it. Possibly the study of the tuberculosis problem among the colored population made by Dr. Louis Hamman, formerly of the Phipps Tuberculosis Dispensary, and Dr. Victor F. Cullen, superintendent of the state sanatorium, has developed the best suggestions so far. Their plan is for the establishment of a number of small sanatoriums by the state, distributed near the larger colored centers; these sanatoriums, whenever possible, to be affiliated with the existing state-aided hospitals and under the general direction of a central body.

MASSACHUSETTS

Paralysis Clinic.—November 21, the first clinic for the benefit of children paralyzed as the result of poliomyelitis was held at the Boston Children's Hospital. The clinic is being conducted by the state department of health and the Harvard Medical School Infantile Paralysis Commission. The hospital had sent out workers to round up the victims of the disease. The clinic will be held at the hospital three times a week.——Dr. William Hall Coon, Springfield, has been named as executive officer of the commission created by Harvard University to work in cooperation with the state department of health in the study of infantile paralysis. Dr. Coon's recent work has been to institute a department of industrial hygiene in a manufacturing company in Chicopee.

Rat Extermination Campaign.—The Women's Municipal League proposes to conduct a rat extermination campaign in Boston, in cooperation with the city officials. The league recommends to the mayor that he proclaim a rat extermination period; that ten stations be named, to which dead rats may be brought; that the department provide for the reception and disposal of the dead rats; that antirat circulars be distributed through the city departments; that posters be placed around city property; that the free use of the municipal buildings be allowed for antirat meetings; that the school committee be requested to allow the distribution of antirat circulars among public school pupils and that an antirat ordinance be passed similar to those in force in New Orleans and other cities.

Personal.—Dr. Hugh Cabot, Boston, surgeon-in-chief of the Harvard Unit at General Hospital, No. 22, western front, France, from June to September, will return to France in February and will retain his place as chief surgeon of the unit until the close of the war.——Dr. Samuel A. Levine, house physician of the Peter Bent Brigham Hospital, Boston, has gone to New York, where he will work in connection with the Rockefeller Institute, and in the spring will use the traveling scholarship of $1,750 awarded him by the Harvard Medical School to prosecute studies in London and Berlin. ——Dr. George Burgess Magrath, Boston, has been made an instructor in legal medicine in Harvard Medical School.——Drs. Allen Greenwood and Morton Prince, who recently returned from the western war front as members of the Harvard Unit, delivered two lectures in aid of the work of the social service department of the Massachusetts General Hospital, November 28 and December 5, respectively.

Vaccination of Schoolchildren.—The state department of health has asked the opinion of the attorney general on certain phases of the compulsory vaccination law relating to children in the public schools. The section of the law relating to schoolchildren provides that "A child who has not been vaccinated shall not be admitted to a public school except upon presentation of a certificate granted for cause stated therein, signed by a regular practicing physician, that he is not a fit subject for vaccination." The health department sought an opinion as to whether the physician signing the certificate must make a personal examination of the child, whether the certificate must be so worded as to show that it is the opinion of the examining and signing physician that the cause stated is sufficient, or so worded that it gives as the opinion of the physician who signs the certificate that the child is not a fit subject for vaccination. The attorney-general gives it as his opinion that when the child presents a certificate signed by a regular practicing physician that he is not a fit subject for vaccination, with the cause stated therein, the statute is complied with, and that a personal examination by a physician is not necessary; nor, in the opinion of the attorney-general, does it seem necessary to require the physician further to emphasize his opinion by asserting that it is also his opinion that the cause stated is sufficient to justify the physician's statement. The cause stated, however, must be an adequate and lawful one to give the certificate validity. A cause absurd on its face, showing a deliberate intent to evade the statute, would not be considered a compliance with it.

MINNESOTA

Personal.—Dr. Leonard C. Weeks, Detroit, has been appointed a member of the state medical board, succeeding Dr. Theodore Bratrud, removed from the state.——Dr. Wilhelm S. Anderson, Warren, has resigned as chairman of the Tri-County Tuberculosis Sanatorium Commission.

The Saving of Infant's Eyes.—A regulation against infant blindness, which was recently adopted by the state board of health, has been signed by the attorney-general and will have the effect of a law. Its provisions require that all physicians or other attendants at births treat the eyes of newborn children with 1 per cent. solution of silver nitrate. Minnesota is the thirty-fifth state to put in force regulations against ophthalmia neonatorum.

State Health Organizations.—The Minnesota State Board of Health has issued a statement to the health officers throughout the state relative to the Minnesota Public Health Association. The latter is a voluntary organization supported by the sale of Red Cross seals and membership dues, and has no authority whatever in the administration of public health laws. There has been more or less confusion throughout Minnesota during the past few years relative to the relationship of this association to the state board of health. There is no relationship whatever between these two organizations.

New Society Officers.—At the annual meeting of the Southern Minnesota Medical Association, held in Mankato, December 4 and 5, under the presidency of Dr. E. Starr Judd, Rochester, Faribault was decided on as the place for the midsummer meeting of 1917, and the following officers were elected: president, Dr. Aaron F. Schmitt, Mankato; vice presidents, Drs. William F. C. Heise, Winona, and Reinhart G. Olson, Nicollet; secretary, Dr. William T. Adams, Elgin (reelected), and treasurer, Dr. George F. Merritt, St. Peter (reelected). On the morning of the second day a portion of the session was devoted to a memorial of Dr. Emil Hess Beckman.——At the twenty-eighth annual meeting of the Southwestern Minnesota Medical Society, held in Worthington, the following officers were elected: president, Dr. Henry Wiedow, Worthington; vice president, Dr. William A. Piper, Mountain Lake, and secretary-treasurer, Dr. Emil King, Fulda.

Health Board Changes Recommended.—The commission named by the governor to propose legislation on public health, of which Dean E. P. Lyon of the University of Minnesota Medical School is chairman, has made the following recommendations: that the state board of health be reorganized with five instead of nine members; be given broad general powers instead of specifying in detail in the law the limit of its duties and activities; should be empowered to appoint a commissioner of public health; should be assigned the functions of the advisory committee on tuberculosis sanatoriums, discontinuance of which is recommended, to be performed by a new division under a man specially trained in tuberculosis work; the transfer from the state department of labor of duties in connection with industrial hygiene; should be delegated organization of all existing state finance activities relating to public health and should be provided with large appropriations. Limitations of the general powers of the board are declared to be dangerous in the changing and sometimes emergency conditions arising in public health administration. In the selection of a commissioner the country should be searched and a man trained in sanitary science and public health administration chosen after a critical analysis of all candidates, and after the right man is found, the safary necessary to secure him should be paid. Other recommendations are made and discussed in the report.

NEW YORK

Personal.—Dr. Edward W. Archibald, Montreal, spoke before the Saranac Lake Medical Society, November 29,

detailing his experiences with the McGill University Unit on the western war front in France.

Poliomyelitis.—Quarantine on account of poliomyelitis was lifted at Oswego, December 5. From August 12 to October 24, Oswego had 60 cases, 11 deaths, 29 patients suffering from paralysis and 20 who completely recovered; 35 patients were between 1 and 5 years of age, 10 between 5 and 10, 5 between 10 and 15, and the remainder between 15 and 35 years.

Suggest State Milk Control.—The Wicks Investigating Committee, which is investigating the milk industry in this state, has developed plans for the state supervision of milk distribution in New York City, which will be embodied in the report of the committee to be submitted to Governor Whitman. The plan suggested would divide the city into districts and license one distributor to a district. This committee in the course of its investigations has brought out the information that some drivers of milk wagons are making from $20 to $25 a week skimming cream from bottles and selling it for their own profit.

New York City

Hospital Must Pay Taxes.—The appellate division of the supreme court has decided that the Manhattan Maternity Hospital must pay taxes on its real estate from 1902 to 1907, because Moses Taylor, who established the hospital, kept the property in his own name instead of transfering it to the hospital corporation.

Personal.—At the last meeting of the medical board of the Union Hospital, Borough of the Bronx, a division of occupational diseases was established and Dr. Frederick L. Loughran was designated as attending physician in charge.——Dr. Joseph Sailer, Philadelphia, delivered an address before the New York Academy of Medicine, December 21, on "The Clinical Aspects of Diseases of the Ductless Glands."

Ruling on Sanatoriums.—At its regular meeting, December 5, the board of appeals fixed the status under the building zone reslutions, of buildings to be used for physician's offices. Such buildings, when arranged for and devoted to use as offices, patients' rooms and laboratories used in connection with physicians' offices, are deemed to be sanatoriums, provided they are not used for other purposes than those specified. A single apartment for the use of a caretaker, however, is permitted in such buildings.

OKLAHOMA

Personal.—Dr. Arthur S. Risser, Blackwell, is convalescent after an attack of typhoid fever.——Dr. Fred H. Clark, El Reno, is recovering from a severe infected wound of the hand.——Dr. John P. Sudderth, Nowata, was thrown from a horse recently and was severely injured.——Dr. Welcome B. Tilton, Clinton, has been appointed physician for the Uintah and Ouray Indian agencies, Duchesne, Utah.

Sanitarium Opened.—The Choctaw-Chickasaw Sanitarium, at Talihina, was opened November 17. The institution, which has been erected at a cost of $50,000, is thoroughly equipped and now available for twenty patients. Only tuberculosis cases will be treated during the first year, but afterward it is expected that sufferers from various diseases will be admitted. The institution is under the superintendency of Dr. W. Edgar Van Cleave, U. S. I. S.

Health Officers Organize.—At a meeting of the health officers of Oklahoma, held in Guthrie, November 16, a permanent association was formed under the name of the Oklahoma State Health Association and the following officers were elected: president, Dr. George W. Stewart, Hobart; vice presidents, Drs. Claude A. Thompson, Muskogee, Lloyd T. Lancaster, Cherokee and Herbert P. Wilson, Wynnewood; and secretary-treasurer, Dr. Lewis E. Emanuel, Chickasha.

PENNSYLVANIA

Improvement in Hospital Methods.—In a report made to Governor Brumbaugh, Dr. John M. Baldy, president of the State Department of Medical Education and Licensure, who has just completed a second inspection of the hospitals of the state, stated that they are generally complying with the requirements of the act of the last legislature relative to laboratory and anesthetic departments.

Personal.—A silver loving cup was presented at the Erie Antituberculosis Society, to its president, Dr. George B. Kalb, who has given up practice and is about to move to California.——Dr. Frank Gamon, Erie, is reported to be critically ill.——Dr. Clarence W. Prevost, Pittston, underwent operation at the Pittston Hospital, for the removal of a tumor.——Major William C. Hogan, Bradford, chief medical officer of the Sixteenth Pennsylvania Infantry, who has been on furlough, left on December 3, on his return to Camp Stewart. December 1, fellow members of the McKean County Medical Society gave a banquet in his honor, over which Dr. James Johnston, chief medical officer of the organization during the War with Spain, presided as toastmaster.

Philadelphia

Personal.—Dr. William J. Baumgartner is under treatment at the Samaritan Hospital, suffering from a fracture of the leg and of several ribs.——Dr. W. Wayne Babcock was operated on for appendicitis, December 15.

Hospital Notes.—A contract has been awarded for alterations and additions to the Women's Hospital.——Builders are now making estimates on plans for the completion of the surgical pavilion of the hospital of the University of Pennsylvania.——Contracts aggregating $681,585 for the erection and equipment of buildings for the new home for the feebleminded at Byberry have been awarded recently.

Health Department to Control Nurseries.—A bill will be introduced in the next legislature to place all day nurseries in this city under the supervision of the department of health and will be supported by all local organizations interested in baby saving and the care of children. The bill provides that no license for a day nursery shall be issued until the person applying for it has been investigated and found qualified to conduct such a place.

Extension Fund for Women's College.—Headquarters were opened, December 4, in the Bellevue-Stratford Hotel for a $200,000 extension fund campaign for the Women's Medical College of Pennsylvania. The funds of the college amount to $490,000, but the time has come for it to extend its efforts to make increasing demands for laboratory equipment and research work, and it is hoped that the endowment fund will be increased to $1,000,000. Up to December 10, the amount collected reached $57,817.94. Ten thousand dollars was given by Mrs. Clarence Clark to establish a scholarship in honor of Mrs. Emily W. Taylor, the donor's mother.

SOUTH CAROLINA

Hospital Chartered.—The Clinton Hospital has been incorporated at Clinton with a capital stock of $15,000 by Dr. Leslie St. C. Hays, M. S. Bailey, and J. D. Bell.

Medical School to Admit Women.—At a meeting of the trustees of the Medical College of South Carolina, Charleston, held at the office of the governor, Columbia, November 22, a petition from the South Carolina Federation of Woman's Clubs, requesting that women be admitted to the college, was read. Dr. Robert Wilson, Jr., dean of the college, recommended that this be done and the board unanimously approved the action. The question of establishing a chair of public health was also discussed by the trustees.

Personal.—Dr. William C. Sandy, medical director of the State Hospital for the Insane, Columbia, has been granted a two months' leave of absence to conduct, under the auspices of the Public Charities Association of Pennsylvania, a survey of the county institutions for the insane in that state.——Dr. Fred L. Potts, Spartanburg, has returned to North Carolina and located at Vanceboro.——Dr. Luther A. Riser, Columbia, has been appointed assistant in field work, U. S. Public Health Service.——Dr. Julius H. Taylor, Columbia, has been elected president of the Association of Surgeons of the Atlantic Coast Line.

WASHINGTON

Appeal for New Health Code.—At a meeting of the members of the legislation from Pierce County, held December 2, in Seattle, a plan was proposed for the state control of all serum used in the state for the tuberculosis tests of cattle, and for the appropriation of more money to be used in the eradication of bovine tuberculosis.

Medical Board Reappointed.—Governor Lister, December 8, announced the reappointment of the following members of the State Board of Medical Examiners, the new terms to expire Nov. 15, 1919: Drs. Daniel M. Stone and Andrew J. Nelson, Seattle; Royal A. Gove, Tacoma; Conrad N. Suttner, Walla Walla; Elmer D. Olmsted and Jesse J. Tilton, Toppenish; James A. MacLachlan, Dayton, and two members who are osteopaths.

WISCONSIN

State Cooperative Laboratory.—The second state cooperative laboratory, organized by joint action of the municipality and the State Board of Health, has been opened at Fond du Lac, with Dr. Frederick M. Harris, La Crosse, as director.

Hospital Notes.—A campaign for a general hospital for Ashland has commenced and Mr. and Mrs. E. R. Currier of New York City have been placed in charge of the arrangements for the collection of funds. A formal organization has been effected, and Dr. John M. Dodd has been elected president, Dr. Adellon P. Andrus, vice president; James W. Good, secretary and treasurer, and Dr. Carl O. Hertzman and W. T. Copple, directors.——A site for the new Portage hospital, on Prospect Hill, has been donated by a former mayor, Alois Zenert. The hospital will cost $25,000, will be known as St. Joseph's Hospital and will be under the charge of the Sisters of the Divine Saviour.

Personal.—Dr. William E. Buschman, Milwaukee, is reported to be critically ill as the result of a cerebral hemorrhage.——Dr. Frederick B. Bentley, Portage, is reported to be seriously ill.——Dr. John Van de Erve, dean of Marquette University, Milwaukee, has been elected president of the Wycliffe Club.——Dr. Bernard H. Oberembt, Milwaukee, who recently returned after seven months' service in the hospitals of Germany and Austria, delivered an address on "The Efficiency of Medical Care in the German and Austrian Service," before the Milwaukee Medical Society, at its last meeting.——Dr. Julius J. Bellin, Green Bay, is convalescent after an operation for appendicitis.

CANADA

Vaughan on Protein Poison.—At the meeting of the Academy of Medicine, Toronto, December 5, Dr. Victor C. Vaughan, Ann Arbor, Mich., was the guest of the evening and was given a dinner by Dr. John Ferguson, the president of the academy, at the York Club. The subject of his address was "The Protein Poison and Its Relation to Immunity and Disease."

Society News.—The Executive Council of the Canadian Public Health Association met in Toronto December 23, and elected the following executive committee: Drs. Joseph D. Page, Quebec, president; John G. Fitzgerald, Toronto, secretary; George D. Porter, Toronto, treasurer; and John W. S. McCullough, Toronto, Maurice M. Seymour, Regina, and William H. Hattie Halifax.

Hospital News.—Returned soldiers will be brought from England in greater numbers than heretofore; the Canadian Military Hospitals Commission has asked Winnipeg to provide hospital accommodation for 1,000 wounded western Canadians. Additions will be made to the Winnipeg General Hospital at a cost of $600,000 to $800,000, and the Dominion Government will pay one-half the maximum cost. The city of Winnipeg and the province will likely combine to pay the other half.——All the hospitals of Ontario are seeking an increase in the annual grant from the Ontario government. A large delegation will wait on the government in the immediate future. The high cost of living and the treatment of returned soldiers necessitate this demand.

University News.—The University of Toronto, through the antitoxin laboratory in the department of hygiene has recently been the recipient of a gift from Col. A. E. Gooderham, Toronto, of a farm of 50 acres on which have been erected model stables and laboratories for the work of the laboratory. The value of the gift exceeds $60,000, and the farm is situated within 20 miles of Toronto. It prepares all the public health biologic products, supplied free by the Ontario government, through its board of health, including diphtheria and tetanus antitoxin, antimeningitis serum, the Pasteur treatment and smallpox vaccine. The laboratory also prepares all the tetanus antitoxin and typhoid vaccine used by the Canadian Expeditionary Forces. The director of the laboratory is Dr. John G. Fitzgerald, Toronto.

Personal.—Dr. Robert D. Rudolf, Toronto, professor of therapeutics at the university, has returned to the front.——Lieut.-Col. D. King Smith, Toronto, has sailed for England and will return to the University Base Hospital at Saloniki.——Dr. Robert E. Clapp has been appointed registrar of the surrogate and county courts of Bruce County, Ont.——Lieut.-Col. Clarence L. Starr, Toronto, is now at the special Canadian hospital at Ramsgate to study orthopedics in connection with Canadian soldiers. On his return several similar institutions will be established in Canada.——Dr. William H. B. Aikins, Toronto, has been elected president of the new American Radium Society.——Dr. G. Bryce Kendrick, Blenheim, Ont., was recently severely injured in a collision on the Pere Marquette Railway.——The following officers in the Canadian Medical Service have recently been mentioned in despatches on the Saloniki operations: Col. James A. Roberts; Lieut.-Col. William B. Hendry; Lieut.-Col. Edward C. Hart, and Maj. Clarence H. Morris.——It is unofficially announced from England that Surg.-Gen. Carleton Jones, C. M. G., and Col. Herbert A. Bruce, Toronto, will return to Canada, the former to resume his duties as Medical Director in the Dominion.

GENERAL

Western Eye and Ear Men to Meet.—The next annual meeting of the Pacific Coast Oto-Ophthalmological Society will be held in Spokane, Wash., June 18 and 19, 1917, under the presidency of Dr. Clarence A. Veasey, Spokane.

Cost of Foot and Mouth Disease.—The combined expenditures of the federal and state governments for fighting foot and mouth disease last year was $9,000,000, according to the report of the United States Bureau of Animal Industry.

Railway Surgeons Meet.—The Soo Line Surgical Association held its annual meeting in Minneapolis, December 13 and 14, and elected Dr. John M. Dodson, Chicago, president; Dr. Albert J. Pullen, North Fond du Lac, Wis., vice president, and reelected Dr. John H. Rishmiller, Minneapolis, secretary-treasurer. It was decided to hold the 1917 meeting in Chicago.

Northwestern Surgeons Elect Officers.—At the annual meeting of the Chicago and Northwestern Railroad Surgeons' Association, held in Chicago, December 13 and 14, the following officers were elected: president, Dr. Frank Allport, Chicago; vice presidents, Drs. William J. Egloff, Mason City, Iowa, and George J. Haslam, Fremont, Neb.; secretary-treasurer, Dr. John D. Andrews, Chicago, and member of the executive board, Dr. William H. Palmer, Janesville, Wis. The meeting is said to have been the largest and most successful in the history of the organization.

Treatment of the Insane in the Canal Zone.—The transfer of the American insane patients under treatment in the Panama Canal Zone to the Government Hospital for the Insane in the District of Columbia, has been recommended by the secretary of war. The secretary has asked for the enactment of the legislation necessary for this purpose. It is planned, however, on ascertaining the legal residence of any such patient, to return him to the place of such residence. The secretary of the interior, under whom the Government Hospital for the Insane is administered, and the superintendent of the hospital have approved the plan.

Tax Reduction on Oleomargarin.—With a view to reducing the price to the consumer, Representative Aswell of Louisiana, has introduced a bill diminishing the tax on oleomargarin from 10 cents a pound to 1 cent a pound. The tax now imposed applies only to the colored article and by increasing the selling price hinders sales. There is but little demand for the uncolored article, even though it is just as wholesome. Last year the army and navy used 750,000 pounds of colored oleomargarin, and foreigners bought 2,500,000 pounds, all free from tax, as they were entitled to do under the law, but they bought less than 20,000 pounds of the uncolored article.

Red Cross Meeting.—At the annual meeting of the American Red Cross, December 13, the treasurer's report showed that the organization had expended $543,535 during the eleven months preceding December 1, for war relief, exclusive of hospital and medical supplies sent abroad. Ernest P. Bicknell, director-general for civilian relief, reported that in response to the request of Austria, the American hospital units would be withdrawn from Serbia and that the Red Cross had arranged to forward and distribute about $150,000 collected for the relief of Lithuanian civilians. Mr. Otto T. Bannard, New York, a member of the commission which investigated the conditions in Serbia, reported that 150,000 Serbians are destitute and near starvation.

Oleomargarin from Pasteurized Dairy Products.—After June 30, 1917, milk and cream used in the preparation of oleomargarin must be pasteurized, and the butter used for this purpose must be made only from pasteurized dairy products, according to service and regulatory announcements of the United States Bureau of Animal Industry. Proprietors

and operators of official oleomargarin-producing establishments will be required to furnish inspectors with satisfactory evidence that the butter used is made only from such products, and to give advance information of proposed sources of the butter supplies so that the matter of pasteurization can be investigated in cases of doubt. In lieu of the use of butter made from pasteurized dairy products, however, the butter itself may be pasteurized by heating it to a temperature of not less than 180 F.

Scientific Society to Meet.—The seventieth annual meeting of the American Association for the Advancement of Science will be held in New York City, December 26 to 30, together with the meeting of about forty national societies affiliated with it. President Charles R. Van Hise of the University of Wisconsin, Madison, will preside.——The Federation of American Societies for Experimental Biology, composed of the American Physiological Society, the American Biochemical Society, the American Society for Pharmacological and Experimental Therapeutics and the American Society for Experimental Pathology, will hold its annual meeting in connection with the American Association for the Advancement of Science, under the chairmanship of Dr. Simon Flexner, New York. In connection with the convocation, a number of addresses will be delivered on phases of the cancer problem. Section K, for Physiology and Experimental Medicine, will devote the afternoon of December 29 to this subject. Prof. Gary N. Calkins, New York City, will discuss "Stimulating Effects of Protoplasmic Substances on Cell Division"; Dr. Leo Loeb, of St. Louis, will read a paper on "Tissue Growth and Tumor Growth"; Dr. Joseph C. Bloodgood, Baltimore, will deliver an address on "Cancer in the Human Being" from the surgeon's point of view with special reference to preexisting lesions which favor the development of cancer; Dr. James C. Ewing, New York City, will summarize as regards radium in the treatment of cancer and Mr. Curtis E. Lakeman, executive secretary of the American Society for the Control of Cancer, will give an account of past and present efforts to combat the disease through the education of the people.

Congress Awakened to Importance of Public Health.—On December 16, the House of Representatives in considering appropriations for the coming year reached those portions of the appropriation bill which concerned the Children's Bureau. The bill, as first read, provided for a total expediture of $106,640, the same sum as was appropriated for the last three years. Representative Good of Iowa asked that the bill be amended to appropriate $178,760. In his discussion, Mr. Good said:

"I do not believe there is any bureau in any of the departments of Congress that is really doing a greater work for all the people than the Children's Bureau is doing."

He also asked to add to the appropriation the following:

"To investigate and report on matters pertaining to the welfare of children and child life, and especially to investigate the question of infant mortality—$72,120."

Several congressmen spoke in behalf of these increased appropriations. Representative Caldwell spoke of the congested districts in New York City. Representative Raker of California spoke for the rural districts, citing frequently from the writings of Miss Lathrop, chief of the Children's Bureau. Very significant were the remarks of Representative Mann of Illinois, who contrasted the immense appropriations for war preparedness with the small sum asked for the prevention of infant mortality. Representative Towner of Iowa said:

"The United States of America, that ought to be foremost in this kind of work, is lagging behind almost every civilized nation of the world in regard to it."

He then recapitulated some of the work which the bureau has done. Representative Barnhart of Indiana said:

"I believe that the Children's Bureau is the longest step in the direction of creating better health, and therefore more happiness for the people of the United States than any other legislative enactment on which I have ever voted, and I want to see it strengthened. . . . Inasmuch as we are so ready to furnish means of keeping and drilling men to take human life, I want to see something done in the direction of protecting and preserving it, and I believe that the enacting of legislation of this sort is going to do something to make better conditions for future humanity, and the trips of the little white hearses less frequent than anything we can do. . . . I want to go slow in spending public money in doubtful experiments of any kind, but when it comes to concern of the future health and happiness of the people, I would rather spend thousands too much than to lack one dollar of meeting a requirement of human welfare."

Representative Sisson of Mississippi spoke against the amendment as he feared that the Children's Bureau with increased appropriation would soon be duplicating the work done by the individual states, and by other departments of the national government. Representave Keating of Colorado spoke for the appropriation, stating that he hoped to live to see the day when this bureau would be spending millions of dollars instead of $300,000 per year. Representative Stafford of Wisconsin spoke against the work of the bureau as now conducted, stating that several of the activities were not national, but purely local in scope. He called attention to the fact that Miss Lathrop wished to establish a traveling car for educational purposes. Representative Cox of Indiana spoke in defense of the bill, particularly in defense of the car mentioned: He said in part:

"The militarists tell us that the first line of defense of a country is in the navy, and that the second line is in its coast line fortifications, and that its third line of defense is in the army. I deny that. The first line of defense of this or any other country is the children of the country, and if by any appropriation or any amount of money, there can be built up in this country a strong, active, fighting race of men and women who are able to take care of themselves, that money, in my judgment, will be well and economically expended."

Representative Davis of Texas spoke in defense of the increased appropriation and Representative Good of Iowa, who introduced it, said:

"Last year we increased the appropriation for foot and mouth disease by $2,500,000. We appropriated over $360,000 for hog cholera. We appropriated hundreds of thousands of dollars for the eradication of the southern cattle tick, of the cotton boll-weevil, and other things of that kind. But when it comes to making an appropriation at all commensurate with the great work of the Children's Bureau, we hesitate and quibble."

He then told of the excellent work which the Children's Bureau has done during the past year. Representative Byrne of Tennessee again spoke against the bill. The question was then taken, and the amendment passed by a vote of 141 to 39. There was then read another paragraph covering the field work of the Children's Bureau, appropriating the sum of $58,000 which Representative Good proposed be amended to give $95,000. Representatives Stafford and Byrne again spoke against this amendment which passed by a vote of 103 to 49. Apparently some congressmen at least are beginning to realize that the health of the people is as important economically for the nation as is the health of its cattle.

FOREIGN

Scarlet Fever in the Netherlands.—There were reported in July 506 cases of scarlet fever, in August 471 and in September 900 cases, with 200 new cases each week for some time thereafter. Amsterdam is the main seat of the epidemic, averaging 100 new cases a week. There were 966 cases of diphtheria reported during the same period. The total population of the country is over six millions; Amsterdam has about 600,000.

Training Nurses for Welfare Work.—The Vienna authorities have organized a six months' supplementary course for trained nurses to fit them for special service in the antituberculosis, the antialcoholism and infant welfare work and for service in epidemics. This is to be a permanent institution, the graduates thus fitting themselves for state positions as *berufsmässige Krankenpflegerinnen in der sozialen Fürsorgetätigkeit.*

WAR NOTES

Aid for American Ambulance Service in France.—More men are wanted in the American ambulance field service in France, according to Emory Pottle, a member of that organization. In an interesting talk, illustrated by motion pictures, Mr. Pottle described the work that is being done at the front by the seven American ambulance units now in France, each with twenty cars. There is, however, but one man to a car, and in order to facilitate the work there should be two. About $500 was raised for the use of the service.

Questionnaire to Hospital.—A committee of American physicians for military preparedness has sent to various hospitals blanks to be filled out showing their capacities and resources in the event of war. Dr. William J. Mayo, Rochester, Minn., is chairman of this committee. The questions include the number of nurses in the hospital, other employees, physicians on the staff, the number of beds and special departments, the character of work done at the hospital, the number of operating rooms and tables, and, in addition, the nearness of the hospital to railroads, trolley lines or water transportation, its water supply and the character thereof, its sanitary surroundings and the facility of local markets for food supplies.

LONDON LETTER

LONDON, Nov. 22, 1916.

Demand for More Women Physicians in the Army

So successful has been the work of the women physicians attached to the Army Medical Corps that that body is now applying for fifty more women for service with the colors. Although women physicians have been attached to various hospitals as house surgeons and physicians during the war, and although one hospital is entirely run by women of the Army Medical Corps, the experiment of sending them to Malta—one of our greatest hospital bases—was not made until last July. There can never be any comparison between the number of men and women physicians available. There are only about 1,100 women on the British Medical Register, as compared with 35,000 men physicians. Many of these women are taking over the civil hospital and private practices; a few are taking up roentgenology and other special work. Under pressure of this need for physicians, the Cambridge University Senate has now under consideration the question of admitting women studying medicine there to the Bachelor of Medicine degree.

Massage of the Heart

At a meeting of the section of anesthetics of the Royal Society of Medicine, Mr. W. M. Mollison reported a remarkably successful case of heart massage following heart failure under anesthetic. A healthy but slight boy, aged 6, was given a mixture of two parts of chloroform to three parts of ether for removal of tonsils and adenoids, considered advisable as a treatment for asthma and bronchitis. During the removal of the second tonsil some struggling occurred and was followed by shock, the pupil dilating and respiration ceasing. After the throat had been swabbed out, artificial respiration by the Silvester method and stimulants were employed without improvement. Pituitary extract was injected subcutaneously, and later into the heart, but evoked no response. The heart sounds could not be heard. An incision was made through the abdominal wall, accidentally cutting into the liver, and the right hand inserted between the liver and the diaphragm. Between this hand and the other, applied to the precordium, the heart, which had ceased beating, was massaged at the rate of ninety movements a minute. At first respiration began and the pupil contracted, but the heart failed to respond; 1 c.c. of pituitary extract was injected into the heart and the massage renewed, and after about twenty movements the heart beat strongly. Almost certainly the time during which the heart stopped was between thirteen and twenty-four minutes, and probably about twenty minutes. The whole episode lasted about thirty-five minutes. When put back to bed the patient's condition was still poor and saline infusion was employed. One hour later the boy was restless and developed choreiform movements, during which the intestines protruded through the abdominal wound, which had been hurriedly stitched up. These were put back later when consciousness returned. For seven days he was more or less unconscious; then consciousness gradually returned with relapses back to unconsciousness. During the second week there were periods of rigidity, tetany and screaming, which was almost continuous for thirty-six hours. He was violent, and there was incontinence of both urine and feces, and he presented the picture of severe cerebral irritation. At the end of fourteen days he was much improved, and eventually made a perfect recovery. Of thirteen recorded cases of successful or partially successful heart massage which Mr. Mollison has collected, in nearly all only a short time had elapsed from the cessation of the heart's beat until the procedure was begun. In this connection the partially successful cases are most interesting, for in them similar unconsciousness, rigidity, cramps, and incontinence had subsequently occurred. The same phenomena accompany cerebral anemia, to which they can be ascribed in these cases. A study of the present case and of the records seems to indicate that heart massage should not be postponed too long, and ought always to be performed through an abdominal wound.

A State Medical Service

In spite of the preoccupation of the war, the question of state medical service in which, as a further development of the insurance act, physicians would be simply officials is hotly debated in the lay and medical press. The British Medical Association has passed a resolution against such a scheme, but has been denounced for doing so without any knowledge of its details. A rejoinder has also appeared in the *Times* from an army surgeon who says that thousands of war physicians have lost or are losing their means of livelihood because of their patriotism. These men, he says, would welcome a state service, and this is not to be wondered at. The panel physicians must realize that the war physicians have also special claims on public gratitude, and that they are, as a class, exceedingly efficient men. It would be monstrous were the people to be deprived of their services after the war. Dr. S. Moone, health officer of Huddersfield, draws attention in the same journal to the advantage of the scheme over the present insurance act. He says that the complaisance of the panel physician in granting certificates of inability to work is seriously depleting the funds of the friendly societies. The panel physician is not in a position at present to refuse to furnish any certificate demanded at his hands by an insured person, except perhaps in the most glaring circumstances of malingering, because the result would be that he would lose his panel, which in many cases is the backbone of his practice. It is manifest that a man whose living and the provision for whose family depends on his panel practice to any considerable extent really has no choice in such a matter. A state medical service offers the only way out. It has, moreover, been pointed out that a state medical service would be merely applying to civil life the same highly organized and efficient medical service which on all sides is admitted to be so successful in the war.

BERLIN LETTER

(Received Dec. 14, 1916)

BERLIN, Nov. 2, 1916.

Nyctalopia

Among 10,000 patients at one military eye hospital, 140 cases of nyctalopia or night blindness came under the observation of Professor Birch-Hirschfeld. In 108 instances the disease was present before the war began, in most of these cases having existed since early youth; but military service seems to have caused greater disturbances than did civil life. In thirty-two cases the condition was noted first during military service. In nine cases an injury, followed by hemorrhage, in five cases intestinal disease, and in three cases light dazzling (*Blendung*) were recorded as being the exciting causes. Myopia was present in sixty cases, to the extent of more than 6 diopters in twenty-six of these. It is assumed, therefore, that myopia is a cause of nyctalopia. A hereditary influence was traced in one third of the cases. Central vision was approximately normal in sixty-three cases, fair in sixty cases and considerably disturbed in seventeen cases. The fundus was normal in sixty-eight cases; in thirty-eight cases the peculiar pigmentation first described by Augstein was present, and in twenty-seven cases there was a deficiency of pigment. In seven cases there was a peripheral chorioretinitis. In the majority of cases the visual field for blue was considerably narrowed, especially in subdued light; thirty-three times for white and blue, even in ordinary daylight, and twenty-eight times there was a reduction of more than 30 per cent. Blue spots on a gray background remained invisible to the nyctalopes after half an hour of rest in the dark longer than to the normal eye. A five point adaptometer, devised by Birch-Hirschfeld, proved to be of great value in the examination of these soldiers. It was found that in the nyctalopes the irritation threshhold frequently is higher than in the normal eye, in many cases following slight disturbance of adaptation, and that the adaptation may be diminished with a normal irritation threshhold. In ninety-two cases both types of disturbance were present. They occurred particularly in the older patients with fundus changes and a reduction of central vision. Forty-nine patients were under observation for several weeks; in only eight cases was there any marked improvement, and six of these were recent cases. Birch-Hirschfeld emphasizes that it is impossible to make a definite prognosis in these cases after a single examination; therefore it is greatly to be desired that these patients remain under observation for several weeks, preferably in a hospital. The treatment consists, in the main, of increasing the resistance of the patient by the administration of tonics and protecting the eye from the light. Reduction in visual acuity and definition of not more than one fourth does not incapacitate the patient for military service, but he should be kept under observation all of the time by the army surgeon, and he should not be subjected to night duty of any sort. Only in exceptional cases should nyctalopia be considered as an adequate reason for granting a pension. Nyctalopia is not

a specific disease or disease entity. Many factors are operative in its production. As a rule, the acute form is easily differentiated from the chronic sporadic form. In the production of the acute form, loss of blood, emaciation, faulty nutrition and poisons play a rôle. Light dazzling (*Blendung*) usually initiates the attack. The prognosis is usually a favorable one. In the production of the chronic form one must consider heredity, local conditions, such as developmental errors in the retina and choroid, and myopia, although nutritional disturbances and toxins may be contributing factors. Birch-Hirschfeld does not agree with Paul that nyctalopia bears any relationship to neurasthenia. Careful examination of these cases confirms the belief that the disease is essentially an organic disturbance of the retina.

The Statue of Robert Koch

The imposing memorial to Robert Koch was unveiled, May 27, in the Luisenplatz, opposite the Kaiserin Friedrich-Haus, the central headquarters for the medical postgraduate instruction system. As is readily understood on account of present circumstances, the ceremonies connected therewith were on a comparatively small scale. Those present were distinguished less by their number than by their prominence. Kirchner, the chairman of the memorial committee, presented the monument to the care of the city of Berlin with a brief address. The main memorial address was given by Gaffky as the oldest pupil and friend of Robert Koch. Of the beauty of the monument, which was hewn in marble by one of the leading sculptors of Germany, Tuaillon, the accompanying picture gives some idea. On the pedestal there are only a few inscriptions:

Front: "Robert Koch. 1843-1910."

Left side: "The pioneer investigator of the causal agents of disease." (Dem bahnbrechenden Erforscher der Krankheitserreger.)

Right side: "The victorious leader in the battle against epidemics and death." (Dem siegreichen Führer im Kampfe gegen Seuche und Tod.)

Rear: "I wish that in the war against the smallest and most dangerous enemies of the human race each nation may endeavor evermore to surpass all others." (Ich wünsche, dass im Kriege gegen die kleinsten aber gefährlichsten Feinde des Menschengeschlechts eine Nation die andere immer wieder überflügeln möge.) The last inscription is taken from the concluding words of Koch's address at the Tenth International Medical Congress at Berlin in 1890.

Statue of Robert Koch.

Spread of Cancer in Bavaria

In the half decade of 1905-1910, approximately 42,000 persons died from cancer in Bavaria. The sex percentage was 100 females to 77 males. The death rate per hundred thousand population, as compared with the total death rate, was as 92 to 100. There was a considerable increase in the incidence of cancer in the female. In the male the gastro-intestinal tract was mainly affected; in the female the uterus and the mammae. Dr. Grassl, who is responsible for these statistics, concludes that the organs most often the seat of cancer or malignant disease are the ones of which the greatest involuntary use is made. There were 891 cases of cancer of the female mammae to five of the male, and seventeen cases of cancer of the mammae in the female to every case of thyroid disease.

Personals

Prof. A. von Hippel, formerly ordinary professor of ophthalmology at Göttingen, died, October 26, at the age of 75.

Professor Hochhaus, director of the medical division of the Augusta Hospital, and ordinary professor of medicine at the academy in Cologne, died, October 26, after a short illness. He was for many years assistant to Professor Quincke at Kiel.

During the latter part of October, Dr. Kurella, a neurologist and translator of Lombroso's works, died in Dresden at the age of 56. He had been for many years editor of the *Centralblatt für Nervenheilkunde* and *Zeitschrift für Elektrotherapie* and founder and editor of the Bibliotek für Sozialwissenschaften.

The Widal Reaction as a Diagnostic Aid

The Royal Health Department of the Kingdom of Saxony has issued the following dicta regarding the diagnostic value of the Widal reaction and the determination of the typhoid bacillus in the blood and feces: 1. The Widal reaction is not specific in the detection of typhoid. It is merely an aid and should be considered only in connection with the clinical history and the nature and degree of the reaction. 2. It may be regarded as positive only in the second week of the disease. 3. A negative Widal should not influence the diagnosis when typhoid is suspected. In such cases the test should be repeated. 4. A positive reaction with a serum dilution of 1:80 is of great value, but it must be remembered that the patient may have had typhoid before, and that in rare instances other diseases, especially jaundice, may give a positive Widal. 5. In the case of individuals who have received a prophylactic typhoid vaccination, the reaction may be positive for from three to five months afterward. 6. A positive diagnosis of typhoid may be made on finding the typhoid bacillus in the blood of persons who have not received a prophylactic injection during the first week of the disease, and later in the blood of vaccinated persons. Material for such examinations is furnished by the authorities. 7. Typhoid bacilli will be found in the feces usually only in cases in which intestinal ulcers have formed, that is, not earlier than the end of the second week of the disease. It is to be noted that typhoid bacilli have been found in the stools of typhoid carriers.

Decrease of Infant Mortality

During the months of June, July and August, the infant death rate of Germany is at its height, and the diseases of the gastro-intestinal tract are largely responsible. Strange as it may seem, the food problem in Germany has not had any deleterious influence on this mortality; in fact, the death rate was lower last summer than ever before. The death rate per hundred infants during the first year of life throughout the German Empire in cities having more than 15,000 population is shown in the accompanying tabulation.

DEATH RATE OF INFANTS

	1910	1911	1912	1913	1914	1915	1916
May	14.4	13.5	13.5	13.3	12.1	14.5	12.2
June	17.6	14.6	13.6	13.7	12.7	17.4	11.2
July	17.6	25.3	18.1	14.2	18.6	18.6	12.6
August	21.6	48.1	19.9	15.9	26.8	17.3	14.9

PARIS LETTER

PARIS, NOV. 23, 1916.

The War

THE PREVENTION OF VENEREAL DISEASES IN THE ARMY

Reports from the army zone and from the interior affirm that a considerable increase in venereal diseases has been observed among the civil population, and still more among the soldiers. The increase is especially notable in the regions occupied either by the troops of our allies or by our colonial

native contingents. An altogether abnormal percentage of the rank and file of the British army are affected with venereal disease; the same is true of the Belgians and Russians. Among the Arabs, whether Algerians or Moors, the proportion of syphilitics is considerably more than one half. There can be no doubt that an increase in clandestine prostitution is the principal cause of this state of affairs; but it is also certain that this epidemic has been propagated among the classes which one would have expected to remain unaffected; and that many married women, including the wives of men at the front, have been infected and will ultimately contribute to the spread of the disease. On account of the gravity of this venereal peril, the undersecretary of state for the medical service of the army has reinforced the prophylactic measures, particularly by creating special organizations for the diagnosis and treatment of these diseases. These organizations are divided into (1) urology, (2) dermatology and syphilology centers. To these centers are to be sent as early as possible not only all patients with characteristic chancres, but also those presenting the slightest suspicious erosion or ulceration. It is expressly forbidden to keep under observation at the regimental hospital a man presenting a suspicious ulceration in order to clear up a doubtful diagnosis. There is one venereologic center for each region, composed of a hospital service, a consultation service, a dental service and a laboratory. The special function of the dental service is to prepare the teeth of syphilitics preparatory to intensive mercurial treatment. This intensive treatment by salvarsan and mercury is necessitated by the urgency of returning valid men to the army as soon as possible. Orders have been issued that periodic lectures on venereal diseases shall be given in all depots and in the medical formations of the army, and that pamphlets on this subject written in a clear and concise style shall be distributed in order to propagate correct ideas on prophylaxis. Further, the military surgeons are called on to lend the utmost support and collaboration to the civil authorities to insure the best possible conditions for the functioning of the venereal service for civilians of both sexes. Daily consultations will be given, the hours of which will vary from day to day, thus making them accessible to all classes of patients. On the other hand, the Ligue française, being of the opinion that the present means of fighting the extension of venereal diseases are inefficacious, has proposed that these diseases be assimilated to other contagious diseases by the adoption of quarantine. Infected women would then remain isolated in special hospitals until cured.

SCIENTIFIC CORRESPONDENCE BETWEEN ARMY SURGEONS AND PHYSICIANS IN THE INTERIOR

The importance of informing medical officers—and in particular the surgeons, with the army or in the interior of the country—as to the progress and results of cases which they have treated and which have passed under the care of other persons is understood readily. It is especially important that surgeons at the front should know the subsequent history of cases in which they have operated: for example, the remote prognosis in craniocerebral operations, the results of early operations on joint wounds, the advantages presented, respectively, by the different methods employed for disinfection for the prevention of infection of war wounds in general, which methods give the best results in fractures, etc. A certain number of surgeons, recognizing the importance of correspondence with their colleagues on these points, have attempted to systematize it in order to apply the information obtained in improving their practice. M. Justin Godart, undersecretary of state for the military service of the army, has decided that this professional and scientific correspondence between medical officers should be generalized, and has strongly recommended this, taking measures to facilitate it. Heretofore it has been by the medium of the wounded themselves that the surgeons at the front have been able to keep track of their achievements. It is sometimes inconvenient, however, to place the soldiers in possession of knowledge concerning details of their illness or of the treatment which they have undergone, as they might be tempted to interpret ignorantly and incorrectly the results of the treatment they have received. For this reason the undersecretary of state has established a special transfer form, containing the necessary information concerning the patient, to be presented sealed to the medical officer. In order to follow up the case the surgeon will enclose with this form envelopes or postcards bearing his military address. The medical officers taking over such cases will naturally fulfil the duty of good fellowship by giving the desired information with a view to mutual instruction and progress.

TREATMENT OF WAR WOUNDS BY THE USE OF SOAP

Drs. Ratynski and Bergalonne recommend the treatment of war wounds by means of soap. A 20 to 40 per cent. solution of white Castile soap in warm water is prepared into which sterilized gauze swabs are dipped and employed to cleanse bloody surfaces. This is followed by free irrigation with soapy water, and by a sort of embalming with soap. One or more compresses of from sixteen to twenty thicknesses of gauze are soaked in the solution and then rubbed vigorously against a piece of soap until they are saturated, after which the compresses are rolled and kneaded between the palms of the hands until a fine and abundant lather is formed in the interstices. In this way there is produced a spongy tissue constituted by innumerable minute soap bodies. All the recesses and cavities of the wound are filled and the surfaces covered with this porous material, and the dressing finished by a thick layer of absorbent cotton and a bandage. This dressing requires renewal every two or three days. Drs. Ratynski and Bergalonne have always observed a remarkable diminution or a total disappearance of pain in wounds treated in this manner. It is noticed that this soapy dressing when changed does not adhere to the wound or neighboring parts, and is readily detached without causing any oozing. Wounds heal up rapidly, irritated and edematous surfaces quickly become pink and exuberant, and granulations rapidly take on a healthy activity from the commencement of the treatment.

THE ESTABLISHMENT OF AN INSTITUTE OF APPLIED OPTICS

The minister of public instruction is studying means to resuscitate, after the war, the industries of optical instrument making and of optical glass making, which in the middle of the nineteenth century emigrated to Germany. In a report on the subject the minister states that the neglect of the theory of optical instruments in France has been the cause of the monopoly of this manufacture by Germany. Our manufacturers have not only been anticipated by the Germans in the search for new markets, but have also found themselves unable to rival our neighbors, because of the lack of sources from which to obtain the indispensable theoretical data. In order to coordinate these efforts, the minister is of the opinion that it is necessary to create an institute of applied optics. This institute would consist of three sections: (1) higher general theoretical teaching; (2) a central laboratory for the examining and testing of glasses and instruments, and (3) professional teaching. The minister of public instruction, cooperating with the minister of commerce, has set up a special commission of scientists, manufacturers and representatives of the administrations concerned, to prepare the statutes and the program of this institute.

Marriages

Lieut. Floyd William Hunter, M. R. C., U. S. Army, to Miss Edith Chase of Brooklyn, in New York City, November 26.

Major Ernest Calvin Lee, M. C., Mich. N. G., Detroit, to Miss Luisa Briggs-Fegan of El Paso, Texas, November 9.

Actg. Asst. Surg. Benjamin Garfield Baker, U. S. N., to Miss Louise Henderson, both of Kansas City, Mo., October 28.

Robert Williams Tomlinson, M.D., Wilmington, Del., to Mrs. Mildred Hutton Bishop, at El Paso, Texas, October 14.

Glen Hunt Broyles, M.D., Kansas City, Mo., to Miss Hazel Bonser of Bethemy, Mo., at Kansas City, November 30.

Capt. Calvin D. Cowles, Jr., M. C., U. S. Army, to Miss Mary Florence Ridenbaugh of Boise, Idaho, October 10.

Charles W. Tedrowe, M.D., Woodward, Okla., to Miss Margaret Chriswell of Elk City, Okla., November 24.

Lieut. Arden Freer, M. C., U. S. Army, to Miss Mary Helen Sheetz of Fayetteville, N. C., November 28.

David Alba Bagley, M.D., De Soto, Ga., to Miss Bessie A. Klosterman of East St. Louis, Ill., November 15.

Godfrey Joseph Kadavy, M.D., Surprise, Neb., to Miss Anna M. Klepetko of Omaha, December 5.

Benjamin F. Walker, M.D., Stockton, Calif., to Miss Ethel Rosenthal of San Francisco, December 6.

Mark Victor Ziegler, M.D., Towson, Md., to Miss Janet Musgrove Bosley of Chicago, October 5.

Deaths

Col. Henry Sutton Tarring Harris, M. C., U. S. Army; Chief Surgeon of the Western Department, with headquarters at San Francisco; was found dead in his rooms, December 17, it is believed from cerebral hemorrhage. Colonel Harris was 53 years of age, a native of Virginia, a graduate of Columbian University, Washington, D. C., in 1884. He entered the army as lieutenant and assistant surgeon in 1886, served as major of volunteers during the war with Spain; became a major, Medical Corps, in 1901; a lieutenant-colonel eight years later and was made colonel, May 5, 1915. He was a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States. He served in expeditions against the Sioux and Cheyenne Indians in Montana, from 1889 to 1893; with General Shafter in the expedition against Santiago in 1898; with General McArthur in his advance from San Fernando to Bautista, P. I., in the fall of 1899; with General Schwann's second expedition through the southern provinces of Luzon, and scouted with General Funston through the mountains of Nueva Ecija and Bulacan, P. I., in 1910.

Harris Bennett Osborne, M.D., Kalamazoo, Mich.; Bellevue Hospital Medical College, 1867; College of Physicians of the City of New York, 1875; aged 74; a member of the Michigan State Medical Society; surgeon of the 113th Illinois Volunteer Infantry, and later post surgeon and health officer of Vicksburg, Miss., during the Civil War; one of the organizers and once president of the Kalamazoo Academy of Medicine; for eighteen years a trustee of the Kalamazoo State Hospital; died at his home, October 6. At a meeting of the Academy, November 14, resolutions on the death of Dr. Osborne were unanimously adopted.

John Savely Cain, M.D., Sewanee, Tenn.; University of Nashville, Tenn., 1853; aged 84; one of the founders and dean of and for many years professor of medical practice and general pathology and pharmacology in the Medical Department of the University of the South, Sewanee; the first student to matriculate in the University of Nashville; professor of gynecology in his alma mater; brigade surgeon in the Confederate service throughout the Civil War; once president of the Association of Surgeons of the Army and Navy of the Confederacy; died at his home, December 3.

Malcolm C. Sinclair, M.D., Grand Rapids, Mich.; Hahnemann Medical College, Chicago, 1873; aged 66; a member of the Michigan State Medical Society; a member and president of the first Board of Registration of Medicine in Michigan; for six years a member of the State Board of Health and more recently a member of the board of examiners for the State Sanatorium, Howell; for six years a member of the City Board of Health; died at his home, November 26, from acute endocarditis.

Isadore Elken Cohn, M.D., Berkeley, Calif.; Cooper Medical College, San Francisco, 1881; aged 64; first surgeon of the Oregon Railway and Navigation Company, Portland, Ore.; later superintendent of the Northern Pacific Hospital at Missoula, Mont.; at one time a member of the staff of the Napa State Hospital and State Quarantine Officer of California with headquarters at San Francisco; died at his home, December 3.

James A. Clyne, M.D., Joliet, Ill.; Albany, N. Y., Medical College, 1886; aged 56; a Fellow of the American Medical Association; once president of the Will County, Ill., Medical Society; for twenty years local surgeon of the Chicago & Alton Railroad; health commissioner of Joliet in 1893 and 1894; died at his home, recently, from disease of the throat.

Capt. R. E. Hoskins, R. A. M. C., Campbellford, Ont.; University of Toronto, Ont., 1914; aged 26; formerly a member of the staff of St. Michael's Hospital, Campbellford; who was attached to the Seventy-seventh Brigade of Royal Field Artillery; was struck by a shell and instantly killed during a battle near Combles, France, September 27.

John Tyler Smith, M.D., Baltimore; University of Maryland, Baltimore, 1877; aged 72; associate professor of medical jurisprudence and hygiene in his alma mater; assistant health commissioner of Baltimore, from 1897 to 1899; once a member of the board of aldermen; died at his home, December 3, from cerebral hemorrhage.

James Plaster English, M.D., Terre Haute, Ind.; Rush Medical College, 1879; aged 62; formerly a member of the Indiana State Medical Association; consulting surgeon to the Union Hospital and one time president of the Terre Haute school board; died at his home, November 26, from cerebral hemorrhage.

Uri Colvin Lynde, M.D., Buffalo, N. Y.; University of Buffalo, 1859; Jefferson Medical College, 1866; aged 83; assistant surgeon of the 116th New York Volunteer Infantry during the Civil War; who fell from a street car in 1910, fracturing the base of the skull; died at his home, November 21.

William C. Huston, M.D., Hamilton, Ohio; Medical College of Ohio, Cincinnati, 1894; aged 48; a Fellow of the American Medical Association; died in Mercy Hospital, Hamilton, December 5, twenty-six hours after an operation for appendicitis.

Rodney J. Bunch, M.D., Table Grove, Ill.; St. Louis University, 1906; a Fellow of the American Medical Association; for two years assistant superintendent of the St. Louis City Hospital; died at his home, December 7, from acute miliary tuberculosis.

Emerson B. Lambert, M.D., Port Jervis, N. Y.; New York Homeopathic Medical College, 1882; aged 64; a Fellow of the American Medical Association; one of the founders of Deer Park Sanatorium; died at his home, about December 9.

William Francis Scott, M.D., Port Washington, Wis.; Rush Medical College, 1877; aged 64; formerly a Fellow of the American Medical Association; died in Mount Sinai Hospital, Milwaukee, November 28, from pernicious anemia.

George Pasfield, M.D., Springfield, Ill.; Washington University, St. Louis, 1886; aged 85; surgeon of Camp Butler, near Springfield, during the Civil War; one of the wealthiest land owners of the state; died at his home, December 11.

Henrietta M. Farquharson, M.D., Chicago; Northwestern University Women's Medical School, Chicago, 1900; aged 50; a Fellow of the American Medical Association; a specialist in diseases of the eye; died at her home, December 9.

Walter Lear Williams, M.D., Mount Carmel, Pa.; Hahnemann Medical College, Philadelphia, 1903; aged 37; president of the Mount Carmel board of health; died at his home, December 3, from acute dilatation of the heart.

Joseph Philip Jones, M.D., Chicago; University of Michigan, Ann Arbor, 1890; a member of the Illinois State Medical Society; died at the home of his son, in Marcellus, Mich., November 25, from cerebral hemorrhage.

Lolita Belle Martinez, M.D., San Francisco; Cooper Medical College, San Francisco, 1908; aged 45; a member of the Medical Society of the State of California; died at her home, December 2, from cerebral hemorrhage.

Martin Van Buren Besemer, M.D., Ithaca, N. Y.; Homeopathic Hospital College, Cleveland, 1875; aged 70; a member of the Board of Directors in his alma mater; died at his home, December 3, from pericarditis.

Harry Pringle Robinson, M.D., Amesbury, Mass.; Harvard Medical School, 1902; aged 41; a Fellow of the American Medical Association; died at his home, November 28, following an operation for appendicitis.

Henry Ryan Marchman, M.D., Villa Rica, Ga.; Atlanta, Ga., Medical College, 1898; aged 48; a Fellow of the American Medical Association; died at his home, November 15, from cerebral hemorrhage.

Norman Wilson Knepper, M.D., Collins, Iowa; Long Island College Hospital, Brooklyn, N. Y., 1882; aged 63; also a dentist; died at his home, November 29, from cerebral hemorrhage.

Joseph H. Owsley, M.D., White Mills, Ky.; University of Louisville, Ky., 1870; aged 75; formerly a member of the Kentucky State Medical Association; died at his home, December 1.

Nelson L. Sweetland, M.D., Newark, Ill.; Rush Medical College, 1867; aged 73; a veteran of the Civil War; died at his home, November 21.

Thomas Henry Wayble, M.D., Toronto, Ohio; University of Wooster, Cleveland, 1883; aged 57; died at his home, August 21, from tuberculosis.

William F. Christ, Weissport, Pa. (registration, Berks County, Pa.); aged 83; died at his home, about November 23, from senile debility.

George R. Robbins, M.D., Hamilton Square, N. J.; Jefferson Medical College, 1870; aged 67; died suddenly at his home, November 30.

Arthur P. Woodward, Northfield, Minn. (license, Minnesota, exemption certificate, 1883); aged 65; died, about November 8.

The Propaganda for Reform

In This Department Appear Reports of the Council on Pharmacy and Chemistry and of the Association Laboratory, Together with Other Matter Tending to Aid Intelligent Prescribing and to Oppose Medical Fraud on the Public and on the Profession

BROMIN-IODIN COMPOUND

Report of the Council on Pharmacy and Chemistry

"Bromin-Iodin Compound," according to the Bromin-Iodin Chemical Company, San Diego, Calif., has the following "formula":

Iodin	Gr. 1
Bromin	Gr. ¼
Phosphorus	Gr. 1/100
Thymol	Gr. ⅖
Menthol	Gr. ⅖
Sterilized Oil	fl. dr. 1

The only statement regarding its method of preparation is the line "Solution in Cod Liver Oil, Norwegian." According to the promoters "Bromin-Iodin" is:

"A Powerful Anti-Tubercular Agent for Hypodermic Use in Pulmonary and Laryngeal Tuberculosis. Useful in other forms of Tubercular Diseases, and in Non-Tubercular Pulmonary Diseases of a Sub-Acute or Chronic Nature."

The "formula," in the form in which the manufacturers publish it, is either impossible or meaningless, according to the interpretation that may be given. It is impossible if it is intended to indicate the actual composition of the product because that would mean that the oil is alleged to contain free or uncombined iodin, bromin and phosphorus. Both on theoretical grounds and also in the light of the findings of the Chemical Laboratory of the American Medical Association, it is not possible that all these constituents can be present in the free state. The formula is meaningless if it is intended to convey the idea, merely, that iodin, bromin, phosphorus, thymol, menthol and sterilized oil are combined to form "Bromin-Iodin." In the absence of any details of the method of manufacture, it is futile to attempt to pass judgment on the actual composition of the preparation.

The use of an almost identical product (said, however, to contain only ½ grain iodin to each fluidram) was described in 1908 by Dr. Ingraham of Binghamton, N. Y., in "Five Years Successful Experience with a Special Mode of Treating Pulmonary Tuberculosis." In 1910 The Journal[1] characterized the preparation as "one of the innumerable 'treatments' for pulmonary tuberculosis that have arisen, had their day and, more or less gracefully, retired." If the preparation had value for the purpose for which it is recommended, its use during these twelve years should have secured its general recognition. There is no satisfactory evidence of its therapeutic efficacy. The Council refused recognition to Bromin-Iodin Comp. and, after submitting this report to the Bromin-Iodin Chemical Company, authorized its publication.

CASTROX

Report of the Council on Pharmacy and Chemistry

Castrox (The Purdue Newberry Co.) is a castor oil emulsion, claimed to contain castor oil 50 per cent., glycerin 10 per cent. with water and emulsifying agents. The advertised claims are that:

"Castrox is prepared by a unique three day process with special apparatus and is more than 'just an emulsion.' It is a MUTUAL emulsion, for the oil and aqueous solution have been united without 'forcing'. . . ."

The rules of the Council declare that: "The use of articles which are unessential modifications of official or established nonproprietary articles is unscientific and serves no useful purpose." The rules further explain: "The application of 'trade names,' protected or not, to official or established nonproprietary products tends to confusion and fosters many abuses."

The Council held "Castrox" to be an unessential modification of an established article, marketed under a proprietary name and with claims which give a false value to a simple castor oil emulsion. It was declared not admissible to New and Nonofficial Remedies.

MORE MISBRANDED NOSTRUMS

Smith's Kidney Remedy.—This was sold as a cure for Bright's Disease, Gravel, Stone in the Bladder, Stricture, Varicocele, etc., by Abner Harvey Duncan, trading as the Smith Medicine Co., St. Louis, Mo. Government chemists declared: "Product is a hydro-alcoholic solution containing glycerin, potassium acetate, trace of alkaloids, and laxative extractive plant drug." The claims were declared false and fraudulent. Defendant pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 4154.*]

Hill's Syrup of Tar, Cod-Liver Oil Extract and Menthol.—Hollander-Koshland Co. (Inc.) of Baltimore was the defendant in this case. The preparation was declared to be "essentially a sweetened hydro-alcoholic solution containing small amounts of chloroform, menthol, morphin and tar; ipecac, tolu, cannabis indica, and wild cherry were indicated; cod-liver oil was absent." It was declared misbranded because the name indicated that the preparation contained syrup of tar, cod-liver oil and menthol, harmless medicinal agents, as its principal and most active ingredients, when its real active ingredients were chloroform, morphin sulphate, opium and cannabis indica. The claim that it was a remedy for "All Diseases of the Throat and Lungs and Asthma" was declared false and fraudulent. Defendant pleaded guilty and was fined $100.—[*Notice of Judgment No. 4171.*]

Mag-No Brand Liniment.—Leslie A. Knight, doing business as the Mag-No Company, St. Louis, Mo., was the defendant. Federal chemists reported that the liniment was "essentially an aqueous solution of ammonia flavored with sassafras oil and colored with a vegetable coloring matter." Sold as an effective remedy for Diphtheria, Rheumatism, Spavin, Scab in Sheep, etc. The claims were declared false and fraudulent. Defendant pleaded guilty and was fined $10 and costs.—[*Notice of Judgment No. 4176.*]

Radway's Sarsaparillian.—This product (alcohol 16.5 per cent.) was reported to be essentially a watery-alcoholic solution of sugar, potassium iodid, arsenic, a trace of alkaloids and certain plant substance. It was sold as a cure for cancer, falling of the womb, paralysis, diabetes, consumption, leucorrhoea, etc. These claims were declared false and fraudulent. Radway & Co. of New York, the defendant, pleaded guilty and was fined $50.—[*Notice of Judgment No. 4179.*]

Dr. Shoop's Diphtheria Remedy and Dr. Shoop's Preventics.—Dr. Shoop's Laboratories, a "patent medicine" concern of Racine, Wis., was made defendant. The "Diphtheria Remedy" was reported "to consist of sugar sirup with a very small amount of soluble chromate, glycerin, and salicylic acid." The claim that it was a cure for diphtheria was declared false and fraudulent. The "Dr. Shoop's Preventics" was reported to be "a tablet containing a small amount of unidentified vegetable extractive matter." It was sold as a "preventive of colds, fevers, grippe and pneumonia"; these claims were declared false and fraudulent. The defendant pleaded guilty to both counts and was fined $50.—[*Notice of Judgment No. 4186.*]

Hot X-Ray Porous Plaster.—The defendant in this case was T. A. Slocum Co., New York. The preparation was reported by the government chemists to be essentially a capsicum (cayenne pepper) plaster. It was sold as a cure for rheumatism, "kidney trouble," croup, pneumonia, angina pectoris, locomotor ataxia, etc., and the claims were declared false and fraudulent. Defendant pleaded guilty and was fined $75.—[*Notice of Judgment No. 4188.*]

N. H. Downs Vegetable Balsamic Elixir.—Henry, Johnson & Lord of Burlington, Vt., was the defendant in this case. The nostrum was reported by the federal chemists to be "a

1. June 4, 1910, p. 1884, reprinted in pamphlet "Consumption Cure Fakes" (price 10 cents), published by the American Medical Association.

sweetened solution of opium, ipecac, glycerin, and small amounts of calcium, potassium, and iron compounds, flavored with anise." The claim that it was a remedy for consumption was declared false and fraudulent. The defendant pleaded guilty and was fined $50.—[*Notice of Judgment No. 4210.*]

Kopp's Baby's Friend.—Over 2,000 bottles of this "baby killer"[1] were seized by the government. The stuff contained 8.5 per cent. alcohol, and ⅛ grain of morphin sulphate to the fluidounce. The claims that it was a safe remedy or cure for wind colic, griping in the bowels, diarrhea, cholera infantum and teething troubles were declared false and fraudulent. The case was not defended. As no one appeared to claim the property, the court entered judgment of condemnation and forfeiture and ordered the United States marshal to destroy this dangerous fraud.—[*Notice of Judgment No. 4213.*]

Prof. Hoff's Prescription.—A preparation, originally known as "Hoff's Consumption Cure,"[2] marketed by Bendiner and Schlesinger, New York. Sold for the treatment of consumption, asthma, bronchitis, hay fever and "catarrh." Government charged that the curative, therapeutic and physiologic effects claimed for the nostrum were false and fraudulent. No claimant appeared for the property and the court ordered that the United States marshal should destroy it.—[*Notice of Judgment No. 4268.*]

Dr. **Haynes' Arabian Balsam.**—Lavinia A. Marsh, who traded under the name E. Morgan & Sons, Providence, R. I., manufactured this preparation which the federal authorities declared misbranded. It was sold under the claim that it was "the most perfect remedy ever known for . . . Erysipelas, Rheumatism . . . Piles . . . Croup. . . ." It was also recommended for deafness and diphtheria as well as for "loss of sight by Palsied Nerves." The federal chemists reported that the stuff appeared to be "a mixture of cottonseed oil, turpentine and oil of cumin." The claims were declared false and fraudulent and applied knowingly and in reckless and wanton disregard of their truth or falsity. The defendant would neither admit nor deny the allegations, putting in a plea of *nolo contendere*, and the court imposed a fine of $20.—[*Notice of Judgment No. 4349.*]

Russia **Salve.**—This preparation, marketed by Redding & Co., Boston, Mass., was sold as a cure for conditions ranging from "cancers" to "mosquito bites" and from "swelled nose" to "ingrowing nails." The government declared that the curative claims were false, misleading and fraudulent. The Williams Manufacturing Co. of Cleveland, Ohio, appeared as claimant and admitted the allegations in the libel. The court permitted the product to be turned over to them after the cost of the proceedings had been paid and a bond of $2,000 executed, by which the company bound itself to remove all the labels and replace them with cartons and circular that should meet the approval of the Department of Agriculture.—[*Notice of Judgment No. 4301.*]

1. See reports of deaths following use of "Kopp's Baby's Friend"; "Nostrums and Quackery," p. 431.

2. See also report in "Nostrums and Quackery" (second edition) and in pamphlet "Consumption Cure Fakes," price 10 cents. The stuff had previously been declared misbranded under its old name (*Notice of Judgment No. 1551*). The previous government report reported the combined "treatment" to contain, among other things, morphin, codein, arsenic, alcohol and chloroform.

Opportunity for Research.—Sometimes one hears the complaint that the world has grown old; that the great discoveries have all been made; and that nothing is left to us now but to work out matters of sheer detail. Perhaps the great and constantly growing mass of rather uninteresting, but otherwise apparently meritorious scientific literature, increases this impression. At certain moments one may long for the past centuries when there was much less to read, and people seemed to have plenty of time to think, and to have endless material for new discoveries and projects. But in reality I do not think that there was ever more scope for new ideas and discoveries than there is at present.—J. S. Haldane: "The New Physiology," *Science*, Nov. 3, 1916.

Correspondence

Early Man and Meat Diet

To the Editor:—It is always a pleasure to read the editorials and comments of THE JOURNAL for their wide interest and eclecticism, but one cannot expect more than a narrowed discussion of a subject which at times will give an imperfect idea of it. Since my work has been quoted (THE JOURNAL, Oct. 21, 1916, p. 1234), permit me a few remarks on the ever recurring discussion on diet.

I believe I have made it clear that I give the anatomic argument only as a pointer in the right direction and not as convincing in itself. It has its place much more to refute an affirmation universally repeated in popular and even scientific books that man finds a justification of his carnivorous habits in his teeth and alimentary canal. The jaws of fruitarian monkeys and herbivorous camels have strong canines which no one invokes as a proof that they should live on animal flesh.

The subject is so complex that it is easy to find arguments for and against any view. The conviction that a fleshless diet is best for civilized man gathers its strength not only from anatomy, but also from physiology, pathology and the social sciences. In pathology, since my book was published, two main arguments of opponents have turned in favor of flesh abstention: Beriberi is cured with unpolished rice. Diabetes is treated by fasting and a diet mostly of vegetable origin.

It is not likely or desirable that people should change their habits abruptly; but, having a responsibility as counselors for the people in their life, we must take care that we are not more anxious to justify our ways and support our prejudices than to give a helping hand in the direction of progress.

Even at the risk of being considered lacking in breadth of views, I confess I see no point at all in the tapeworm argument. I know that some habits and structures of low forms of life are so invariable that they appear to have come from an immemorial past; but I am aware also that we know next to nothing of the inner causes of variations. All that can be safely said about them is that they "happen." Then what ground is there to presume that a variation of a given species either in form or habit has taken place a hundred, a thousand or a million years ago, especially when there are no geologic deposits to support one view or another? When it comes to biologic history, facts and their relation are so uncertain that they have no strength against sound experimental evidence of the present day.

There is no discussion about the fact that man can live and is adaptable to many kinds of foods. But this adaptability is in favor of any change that may commend itself through scientific findings, economic conditions and moral development.

I do not think we can condemn the use of animals for man's needs and comfort, but I think there are many abuses that need eradication. Animals are not made for man. I believe that our use of animals must be directed by the idea of an exchange of services. This may seem a far fetched proposition, and its working out theoretically might give rise to seeming impossibility.

There is a latent perfection in process of becoming that man has in himself and against which nothing can prevail definitely. This may be called a belief, if you will. There are some people who can live only by belief or faith, for they find very little comfort in mere existence.

J. L. BUTTNER, M.D., Château de Passy, Passy par
Véron (Yonne), France.
Assistant Surgeon, Hôpital 32 bis.

[COMMENT.—Our correspondent refers to the Current Comment on recent zoologic evidence that man and his ancestors have long indulged in three forms of animal food which today are commonly found in our markets. So far as the advocates of the fleshless diet, of whom Dr. Buttner has long been a recognized representative in the literature of vegetarianism (see Buttner, J. L.: A Fleshless Diet, New York,

F. A. Stokes Company, 1910) appeal to a "belief" in the worth of their cause, they carry the questions involved beyond the realm of purely scientific discussion. The same is true of the advocacy of a dietary scheme which commends itself through "moral development." Physiology is not concerned with these purely ethical speculations, however fitting they may be in any scheme of human conduct. The *new evidence* quoted in favor of abstention from flesh does not appeal to us as at all convincing in respect to any inherent superiority of this plan. Beriberi is not relieved because of the superiority of unpolished rice over animal products as an antineuritic. Animal tissues can furnish the curative vitamin; in fact, it was through the use of meat that the disease was first controlled in the Japanese navy. And as for the modern dietotherapy of diabetes, surely fasting or semistarvation on a diet of green vegetables ought not to be adduced as indication of the triumph of the vegetarian propaganda.—ED.]

Patenting of the Walsh Window Tent

To the Editor.—Among the advertisements in THE JOURNAL, Nov. 4, 1916, p. 00, I noticed one of the so-called Walsh window tent, which begins as follows:

> Four physicians invented it. The patents of Dr. W. E. Walsh, Dr. S. A. Knopf, Dr. J. H. Williams, and Dr. W. B. McLaughlin, are all combined and built into the Walsh Window Tent.

That I invented the first window tent which bears my name I do not deny. I protest, however, against the statement in this advertisement to the effect that I have taken out a patent. This device was worked out particularly for the benefit of the consumptive poor who cannot have the luxury of an outdoor porch. I feel that I ought to give the American medical profession an explanation of how this window tent came to be patented at all.

Dr. W. B. McLaughlin was my resident physician at the Health Department's Riverside Hospital-Sanatorium on North Brother Island, New York, at the time when I was experimenting with the tent. He offered to make a model for me, but it was unsatisfactory and I could not use it in connection with a paper on the subject to be read before the County Medical Society. The Kny-Scheerer Company made me another model, which I presented at the meeting. Nevertheless, in appreciation of Dr. McLaughlin's efforts, I published the paper which I had read before the County Medical Society, Feb. 27, 1905, under his and my name in the *New York Medical Journal*, March 5, 1905. Although he had been urgently invited to be present at the meeting of the County Medical Society and share in the reading of the paper, Dr. McLaughlin did not come, and the next thing I heard was that he had taken out a patent on the window tent in his name. He made arrangements with the manufacturers of the window tent to receive a royalty for each tent made, and later on sold the patent to the Walsh Window Tent Company (Quincy, Ill.

I interviewed patent lawyers to find out what I could do to contest the unjust patenting of a life-saving and health-giving device. I was told that such a suit was likely to cost several thousand dollars, and since Dr. McLaughlin had complied with all the legal requirements prior to taking out the patent, the outcome would be doubtful. I did not feel that I could afford to risk such a large sum, but in my popular writings on tuberculosis, including my international prize essay, I made it a point thereafter to describe the mechanism of the tent completely so that any one handy with tools could make one for himself.

S. A. KNOPF, M.D., New York.

The Country Practitioner as the "Goat"

To the Editor:—From a perusal of the extracts of discussions at the last meeting of the American Association for the Study and Prevention of Infant Mortality (THE JOURNAL, Dec. 9, 1916, p. 1785), it appears that the rural practitioner is the cause of all evils in rural obstetrics.

One speaker said, "These men [rural doctors] are sent out from our medical colleges and schools with nothing but a smattering of knowledge of the mechanics of childbirth," but failed to say that in the same graduating class are men who decide to cast their lot in the city, and according to the same theory should bungle things in an obstetric manner in the city. I, for one, believe that the average rural practitioner is just as capable as his city classmates, if not more so.

The conscientious country doctor makes as many after-calls and is as anxious for a successful puerperium as the city man. It behooves the rural practitioner to be successful in this line of work, since much of his practice is of this kind; and if he fails to make good it means general failure.

True, as was said, he is often confronted by a number of obstacles of which the city man, who has his nurse on the case to depend on, knows nothing. He must act as physician and nurse too, and manages to do pretty good work at that.

There undoubtedly is plenty of room for improvement, not alone in the country but also in the city, before the ideal obstetric condition will be reached, and we can only hope that sometime in the future we may have all the advantages which our city friend has.

ERWIN C. CARY, M.D., Reedsville, Wis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

SLEEPINESS AS A SYMPTOM

To the Editor:—Please refer me to literature on sleep and sleepiness as a presenting symptom in disease, or advise me in what conditions or diseases, other than trypanosomiasis and catalepsy, sleep is a marked symptom. I have two cases in which sleep is the only marked symptom, and a diagnosis is yet to be made.

B. L. LIGGETT, M.D., Mill Creek, W. Va.

ANSWER.—A reference to the literature on the subject of sleepiness is impracticable. The causes are so varied and numerous that it would be like a reference to the literature of medicine. Sleepiness or drowsiness may occur as a symptom in many diseases, for instance: anemia, atony of stomach (after meals), abscess of brain, asphyxia, acute yellow atrophy, alcoholism (acute), bromism, cerebellar disease, chlorosis, cold (intense), commencing coma, concussion of brain, delirium tremens, dilatation of the heart (daytime), dyspnea (severe), embolism (clot, or fat), encephalitis, epilepsy, gangrene of lung, hematoma of dura mater, hydrocephalus, hysteria, hemophilia, hookworm disease, intermittent fever at end of paroxysm, pernicious intermittent jaundice, lithemia (after meals), liver disorders, meningitis (simple, tuberculous or cerebrospinal), narcotic poisoning, chronic nephritis, neurasthenia, petit mal, plague, remittent fever, spina bifida, softening of the brain, septicemia, trypanosomiasis, chronic gas or narcotic poisoning, typhus, typhoid, typhic state, uremia and Winkel's disease.

R. Goiffon has recently published a general review of digestive narcolepsy (*Arch. d. mal. de l'app. digestif*, 1916, ix, 95).

RESPONSIBILITY OF SURGEON

To the Editor:—Could you give me any special information regarding the responsibility of the surgeon in the operating room, that is, whether his responsibility ceases the moment he is through operating, or whether it continues until the patient is safely on his way to his room? Also, as to the responsibility of a private hospital for the actions of its nurses while they are under the operator's orders in the operating room?

A. H. F.

ANSWER.—The question is not clear as to the point involved. No definite rule can be laid down applicable to all cases as to when the responsibility of the surgeon ceases after an operation, as it depends on the facts in the particular case. As a general rule the surgeon is responsible for his own acts and the acts of his assistants. If the surgeon owns the hospital or personally employs the assistants, he would be responsible for any damage done the patient as a result of negligence on the part of any one connected with the hospital. If the surgeon is in no way connected with the ownership of the hospital, and has nothing to do with the employment of the help, the responsibility for damage to the patient, due to negligence other than that of the surgeon, would rest on the hospital.

For acts done by the personal assistants of the surgeon, if done under his direction and supervision, the surgeon would

be held responsible, whether done during or after the completion of an operation; but for a harmful act done by the surgeon's assistant (a medical man) on his own initiative without the knowledge or consent of the surgeon, the surgeon would not be responsible.

It is the duty of the surgeon to see that the patient after an operation is placed in safe, competent hands, and he would be held liable for any harm that might come to the patient as a result of going away and leaving the patient on the operating table, while coming out from under the influence of an anesthetic, even though the operation were entirely finished, without seeing that a competent, reliable person was left in charge.

It will be necessary to know the particular facts in the case in order to formulate a more definite answer.

THE RECTAL TUBE AND HIGH INJECTIONS

To the Editor:—Your answer to the query on this subject (THE JOURNAL, Dec. 2, 1916, p. 1688) was very comprehensive and complete, and should be convincing. All rectal surgeons have been curious concerning the function of the rectum and pelvic colon, and, together with the roentgenologist, have solved many of their problems. We know that the yielding tube can be passed, with certainty, into the pelvic colon only through a sigmoidoscope. No one uses the term "sigmoid colon" now.

For high injections, the high introduction of a tube of any sort is quite unnecessary. When fluid is run under a steady pressure of 3 feet from a funnel or a douche can, through a tube, into the intestine, it will reach the cecum without difficulty, as is demonstrated daily in any complete Roentgen laboratory. It is quite unnecessary to assume any special position, or series of positions, which are usually suggested. The fluid runs in easily when the patient lies on the back. Low pressure injections are passed into the pelvic colon with difficulty sometimes on account of that organ being held in the pelvis, and its flexure with the rectum being acute. Increasing the pressure for a few moments will overcome the resistance, and fluids will reach the cecum in a short time. Any tube which passes the internal sphincter muscle is long enough for a "high injection."

Doubting Thomas will rise to be heard from time to time, and proof will be demanded. This is readily furnished by the roentgenologist; but the progress of a fluid in the colon may be demonstrated by palpation, percussion and the aid of a stethoscope.

C. C. MECHLING, M.D., Pittsburgh.

SACCHARIN AND GLYCERIN IN DIABETES

To the Editor:—How are saccharin and glycerin regarded as sweetening substances in foods in diabetes?

A. F. KINGSLEY, M.D., Battle Creek, Mich.

ANSWER.—In experimental diabetes in lower animals, it was found that the administration of glycerin led to a reduction in the amount of sugar excreted. This substance was then tried in human diabetes, and some favorable results were reported. Recently little has been said concerning it. In large quantities, glycerin is not innocuous. As a sweetening agent it has been replaced by saccharin. Saccharin is said, by some observers, to slow the action of the digestive enzymes. This retarding influence, however, seems negligible in such quantities as can be administered for sweetening purposes. According to Food Decision 142 of the Department of Agriculture, the referee board found that saccharin in quantities exceeding 0.3 gm. a day, was liable to cause digestive disturbance. Provided this quantity is not approached, saccharin may be regarded as therapeutically unobjectionable as a sweetening agent in diabetes.

LACTÉOL

To the Editor:—I should like any information which can be obtained of a preparation known as lactéol du Dr. Boucar of Paris. Is the formula known? It is supposed to be a lactic acid ferment.

X. Y. Z.

ANSWER.—Lactéol appears to be one of the many lactic acid ferment preparations. The advertising material is of the usual exaggerated character, suggesting that lactéol may be considered a prophylactic measure against diseases of intestinal origin in which, at least by inference, are included not only typhoid fever, appendicitis, etc., but also dermatoses, such as eczema, urticaria, herpes, acne and psoriasis, hepatic and renal disturbances, arteriosclerosis, migraine and cardiac diseases. When considering the fact that the preparation is made in Paris, it should be borne in mind that since bacteria in lactic acid ferment preparations are not long lived, imported cultures may be inactive by the time they are used in this country.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 9. Chairman, Dr. W. H. Sanders, Montgomery.

ALASKA: Juneau, Jan. 3. Sec., Dr. H. C. DeVighne, Juneau.

ARIZONA: Phoenix, Jan. 2. Sec., John Wix Thomas, 306 Goodrich Bldg., Phoenix.

CALIFORNIA: Sacramento, Jan. 9. Sec., Dr. C. B. Pinkham, Forum Bldg., Sacramento.

COLORADO: Denver, Jan. 2. Sec., Dr. David A. Strickler, 613 Empire Bldg., Denver.

DISTRICT OF COLUMBIA: Washington, Jan. 9. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

ILLINOIS: Chicago, Jan. 24-25. Sec., Dr. C. St. Clair Drake, Capitol Bldg., Springfield.

INDIANA: Indianapolis, Jan. 9-11. Sec., Dr. W. T. Gott, 120 State House, Indianapolis.

MINNESOTA: Minneapolis, Jan. 2-5. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

NEW MEXICO: Santa Fe, Jan. 8. Sec., Dr. W. E. Kaser, East Las Vegas.

NEW YORK: New York City, Albany, Syracuse, and Buffalo, Jan. 29-Feb. 2. Chief, Examinations Division, H. H. Horner, University of the State of New York, Albany, N. Y.

NORTH DAKOTA: Grand Forks, Jan. 1. Sec., Dr. G. M. Williamson, Grand Forks.

OKLAHOMA: Oklahoma City, Jan. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

OREGON: Portland, Jan. 2. Sec., Dr. Herbert S. Nichols, 803 Corbett Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 9-11. Sec., Nathan C. Schaeffer, Capitol Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 4-5. Sec., Dr. G. T. Swarts, State House, Providence.

SOUTH DAKOTA: Pierre, Jan. 10. Sec., Dr. P. B. Jenkins, Waubay.

WASHINGTON: Spokane, Jan. 2. Sec., Dr. C. N. Suttner, Baker Bldg., Walla Walla.

WISCONSIN: Madison, Jan. 9-11. Sec., Dr. John M. Dodd, 220 E. 2d St., Ashland.

Illinois June Report

Dr. C. St. Clair Drake, secretary of the Illinois State Board of Health, reports the written examination held at Chicago, June 21-23, 1916. The total number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 281, of whom 230 passed and 51 failed. Six candidates did not complete the examination. The following colleges were represented:

College	Year Grad.	Total No. Licensed
PASSED		
Bennett Medical College	(1915)	2
Chicago College of Medicine and Surgery	(1913) (1914, 2) (1915, 3) (1916, 62)	68
Hahnemann Medical College and Hospital, Chicago	(1916)	9
Jenner Medical College	(1913) (1916, 2)	3
Loyola University	(1916)	15
Northwestern University	(1916)	17
Rush Medical College	(1913) (1916, 36)	37
University of Illinois	(1915, 2) (1916, 46)	48
University of Louisville	(1916)	1
St. Louis University	(1915, 4) (1916, 11)	15
Eclectic Medical College	(1913)	1
Ohio State University	(1916)	1
University of Pennsylvania	(1906)	1
University of Toronto	(1910)	1
FAILED		
Howard University	(1914)	1
Bennett Medical College	(1914) (1915)	2
Chicago College of Medicine and Surgery	(1915) (1916, 9)	10
Chicago Hospital College of Medicine	(1913)	1
Hahnemann Medical College and Hospital, Chicago	(1914) (1916)	2
Illinois Medical College	(1910)	1
Jenner Medical College	(1915) (1916, 3)	3
Loyola University	(1916)	14
Northwestern University	(1916)	2
Reliance Medical College	(1911)	1
Rush Medical College	(1916)	1
University of Illinois	(1914) (1916)	2
University of Louisville	(1913)	1
Detroit College of Medicine	(1904)	1
Minnesota College Hospital	(1884)	1
National University of Arts and Sciences	(1916)	1
Meharry Medical College	(1913) (1915, 2)	3
University of Moscow	(1895)	1
University of Geneva	(1899)	1

Virginia June Report

Dr. J. N. Barney, secretary of the Virginia State Board of Medical Examiners, reports the written examination held at Richmond, June 17-20, 1916. The total number of subjects

examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 96, including 1 osteopath, of whom 86 passed and 8 failed, including 1 osteopath. Twenty-one candidates were licensed through reciprocity. One candidate did not complete the examination and one withdrew. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Howard University	(1916)	83
Kentucky School of Medicine	(1882)	84
College of Physicians and Surgeons, Baltimore	(1895)	75
Johns Hopkins University	(1916)	85
University of Maryland	(1915) 84; (1916)	78, 88
Boston University	(1916)	81
Columbia University	(1916)	90
Hahnemann Medical College and Hospital of Philadelphia	(1916)	79
Jefferson Medical College of Philadelphia	(1916)	83
University of the South	(1899)	84
Vanderbilt University	(1916)	83
Medical College of Virginia	(1914) 80; (1915) 75, 80, 80, 81; (1916) 75, 75, 75, 75, 75, 76, 76, 76, 76, 76, 77, 77, 78, 79, 79, 79, 79, 80, 81, 81, 81, 81, 82, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 85, 85, 85, 85, 86, 86, 86, 87, 87, 87, 87, 88, 88, 90, 94.	
University of Virginia	(1916) 75, 78, 87, 83, 84, 87, 87, 87, 88.	
McGill University	(1913)	84
FAILED		
National Medical University	(1906)	68*
Baltimore University	(1904)	51
North Carolina Medical College	(1915)	63
McHarry Medical College	(1915)	63
University of West Tennessee	(1916)	62
Medical College of Virginia	(1912) 61; (1916)	64

* Graduation not verified.

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Columbian University	(1898)	Dist. Colum.
George Washington University	(1910)	Dist. Colum.
Atlanta School of Medicine	(1909)	Georgia
Bennett Medical College	(1914)	W. Virginia
University of Louisville	(1914)	Kentucky
College of Physicians and Surgeons, Baltimore	(1905)	N. Carolina
	(1909)	W. Virginia
University of Maryland	(1911) (1914)	Maryland
Leonard Medical School	(1906) North Carolina; (1913)	W. Virginia
North Carolina Medical College	(1914) Maryland; (1915)	N. Carolina
Jefferson Medical College of Philadelphia	(1914)	N. Carolina
Medico-Chirurgical College of Philadelphia	(1899)	Penna.
Medical College of the State of South Carolina	(1910)	S. Carolina
Lincoln Memorial University	(1915)	Tennessee
Medical College of Virginia	(1900) West Virginia; (1914, 2)	N. Carolina
Manitoba Medical College	(1907)	Manitoba

Washington July Report

Dr. C. N. Suttner, secretary of the Washington State Board of Medical Examiners, reports the written examination held at Tacoma, July 4-6, 1916. The total number of subjects examined in was 11; total number of questions asked, 121; percentage required to pass, 75. The total number of candidates examined was 37, of whom 33 passed, including 6 osteopaths, and 4 failed, including 2 osteopaths and 1 chiropractor. The following colleges were represented:

College	Year Grad.	Per Cent.
PASSED		
Georgetown University	(1915)	90.7
George Washington University	(1912)	79.4
Rush Medical College	(1892) 85.5, *; (1902)	80
Loyola University	(1916)	89.5
University of Louisville	(1910) 87.1; (1916)	85.5, 9[illegible]
College of Physicians and Surgeons, Baltimore	(1915)	91.8
Johns Hopkins University	(1912) 86.5; (1914)	93.7
University of Michigan Medical School	(1916)	81.9
John A. Creighton Medical College	(1916)	78.8
Starling Ohio Medical College	(1913)	85.4
University of Oregon	(1908) 80.9; (1915) 90.7, 93.2; (1916)	79.7, 87.9
Jefferson Medical College	(1914) 81.3; (1916)	82.2, 82.9
University of Vermont	(1908)	76.8
McGill University	(1914)	83.6, 84.3
Sal. Sci. Medical College†	(1892)	*
FAILED		
Physio-Medical College of Eclectic Medicine and Surgery	(1883)	*

* No grade given.
† The name of this college does not appear on the official list of reputable Japanese Medical Schools.

Connecticut Homeopathic August Report

Dr. E. C. M. Hall, secretary of the Connecticut Homeopathic Medical Examining Board, reports that one candidate, a graduate of the Boston University, School of Medicine, in 1907, was licensed, Aug. 15, 1916, through reciprocity with Massachusetts.

Social Medicine, Medical Economics and Miscellany

HOSPITAL PROBLEMS OF GONORRHEA AND SYPHILIS*

JOHN H. STOKES, M.D.
ROCHESTER, MINN.

Sexual disease is only just beginning to obtain recognition as a hospital problem. The scanty attention it has received has been due less to ignorance of its importance than to deliberate refusal to deal with it. Two recent estimates agree in showing that, excluding frank syphilis, about 6 per cent. of all patients undergoing treatment in a general hospital have positive Wassermann reactions. Another report mentions 10 per cent. positives in 500 cases. Only 2 per cent. of these were diagnosed clinically as syphilis. This is "incidental syphilis," so to speak. For syphilis frank and uncomplicated, few hospitals profess to make any provision whatever. In 1914 it was estimated that the city of London, with a population of 7,000,000, had 163 beds actually available for the care of sexual diseases. The Sydenham Royal Commission has just found the same condition throughout Great Britain. Of thirty general hospitals in New York City, a recent investigation showed that only ten receive recognized cases of syphilis in active stages. Nine receive adult cases of gonorrhea needing hospital attention, and three receive and treat active gonorrhea in little girls. Thirteen of thirty will not even receive medical cases with known syphilis or gonorrhea. Detroit until recently made no provision for hospitalizing active sexual disease, but has now developed two clinics. Chicago has the Cook County Hospital, the only open special service I know of in the city—200 beds to 2,000,000 people. The problem exists—it has simply been ignored. Pontopidan, on the basis of a large experience with the Danish system, estimates that one bed to 2,000 of the population is insufficient for the adequate care of sexual diseases. How desperately we need a general survey, to show us the extent to which we fall short even of this ideal, can be imagined.

The problem of the hospitalization of sexual disease is interwoven with the venereal stigma. The first effort in the development of hospital service for the sexual diseases must be directed at breaking up the venereal connotations and clearing up the confusion of medical and moral issues which have muddled our outlook. As a practical illustration, the customary association of syphilis and gonorrhea on a service seems to me to contribute little to the care of either, and to favor directly the perpetuation of the venereal stigma on them both. Gonorrhea can be smuggled into the hospital under the cloak of genito-urinary surgery, and syphilis under that of diseases of the skin, since dermatologic opinion is so essential to the diagnosis of the disease during a large part of its course. Such an evasion sidesteps a temporarily unmanageable public prejudice and ignorance, and allows us to proceed at once with practical measures while the slow work of reeducating sentiment is carried on.

Making sexual disease the province of the general, and not of the special venereal, hospital is another form of the same method to break the force of the venereal stigma. This principle has been recognized most recently in the recommendations of the Sydenham Commission, and is now incorporated in the provision being made by the Local Government Boards of Great Britain for the care of these diseases. We would be retrogressing, I believe, if we subscribed to any other point of view in this country. Nothing will go farther to popularize good treatment than to make the recipient of it inconspicuous.

Speaking now directly about syphilis, with which I am more familiar, eight ways occur to me in which the general hospital can contribute to the management of the disease:

1. *A Study of the Entering Patient by a Serologist.*—A competent serologist in a hospital laboratory can detect the disease in 6 per cent. of the hospital population in whom it is more or less concealed. The routine Wassermann test on

* From the Mayo Clinic.
* Read before the American Public Health Association, Cincinnati, Oct. 25, 1916.

entering patients is then an ideal to be striven for, and will ultimately take its place with urinalysis and the estimation of blood pressure as part of an adequate examination. Dark-field equipment should also be installed to aid in the quick diagnosis of acute cases, doubtful mucous recurrences, etc. Such recognition of entering syphilis is insurance for the staff, in whom, in general, house infection is too common and entirely avoidable.

2. *Prolonged Observation.*—Prolonged observation of a patient in a hospital under control is an asset in the care of any disease, and in none more than syphilis. The brilliance and éclat of even reasonably effective therapy often leads one to slur over the valuable impressions as to the patient's resistance and reaction which have been gained by deliberate and painstaking observation of the case from day to day. The carefully made chart, and the cooperative opinions of aurists, ophthalmologists and internists based on continued study have a special value in outlining prognosis and determining future treatment. The treatment of active hereditary syphilis was first recognized by Welander as the province of the school-hospital, an institution as yet unknown for this disease in this country. Lumbar puncture should also, in my opinion, be a hospital procedure.

3. *Intensive Treatment.*—The most intensive treatment of syphilis, especially before the patient's tolerance and condition have been determined, is best carried out, in my opinion, not under ambulatory conditions, but in the hospital. This is especially true of the administration of salvarsan, the first injection of which may be followed by sharp reactions even with graded doses, and later by imperative warnings of intolerance. Ambulatory technic for this treatment necessitates reductions in the later dosage and lengthening of the intervals. The clinician's control over his technic and procedure, sacrificed when the patient is allowed to go unobserved after the injection, is vital to long-run successful results and should, I believe, become a standard and universal feature of our practice.

Severe constitutional involvement in early syphilis is not uncommon and deserves hospital care. Even the milder grades of infection make striking gains under diet and rest, both of which are valuable adjuncts to specific treatment of which the patient can seldom avail himself outside of a hospital. The accidents of late syphilis in viscera and nervous system usually profit by and deserve hospitalization.

4. *Quarantine.*—As a contagious disease, syphilis in many cases needs hospitalization for temporary quarantine. Especially is this true of the irresponsible and ignorant, who should be compelled to accept it if necessary. Temporary sterilization by a single dose of salvarsan in the dispensary carries with it serious later risks of neurorecurrences, and is hardly a substitute for the inhibitory effect, for example, of a series of three doses in six days, such as hospital control permits. Quarantine, deliberate study and massive treatment effects, these three alone, justify and make imperative beds for all syphilitics in active stages of the disease.

5. *Social Aspects.*—I am fond of comparing the hospital service for syphilis with the sanatorium for tuberculosis. It is essentially a sanctuary for many, and provides, moreover, a place and opportunity to reconstruct and rehabilitate the victims of one of the most peculiarly distressing of human ailments. Morale forms an important though often little appreciated factor in the course of the disease, and social responsibility must be made to reach a high plane in the victims of syphilis if those around them and society at large are to be protected from harm. In the comparative calm and sequestration of the hospital, separated for a short time from the bustle of affairs, and under the influence of far-sighted and humane physicians, impressions and suggestions can be made with greater hope of permanence than under average outside conditions, and more prolonged and effective cooperation for cure established and maintained.

6. *Treatment Control.*—I should like to urge, without excluding the dispensary from the field, the possibilities of the hospital clinic for syphilis as a center for treatment control. Haphazard and incidental care mars the whole modern scheme for the effective treatment and cure of the disease. A little treatment may be worse than none at all. Yet this is all the average patient gets. "Pillar to post" summarizes his fate. Of all things, he needs most one central governing power, always interested in his condition, always directing his course toward cure, always in full possession of the facts about his case. Patients seize on this idea with avidity, and I am encouraged to attempt a practical scheme of the sort for the Rochester service. The prestige of a hospital, its disinterested character, the ample facilities for the development of the necessary record and follow-up system, all make it potentially an effective instrument for this sort of work.

7. *Cooperation.*—Those who work with syphilis in hospital and dispensary, trying to carry through modern methods of cure, realize that outside medical cooperation, when it must be used, too often proves a weak tool. Lack of cooperation, lack of the spirit of cooperation, lack of the common knowledge and methods which make cooperation possible, lie at the bottom of it. The patient gets pills when we know he needs rubs, or iodids when he should be saturated with mercury. The hospital service has it in its power to spread higher ideals of treatment, and to illustrate them to physicians who wish to cooperate with it in the care of its patients. It is not beyond reason for a clinic to maintain a register of physicians who have taken the trouble to visit it and ascertain its methods, and besides offering them valuable information, regard them as a sort of cooperative outside staff, and refer patients to them for intelligent care. Such a reference list of men who will treat patients sent them by methods in harmony with those of the central bureau, and in cooperation with it as well, seems worth trying for, at least to one who has daily reason to appreciate the chaotic condition of syphilitic therapy among physicians in general practice.

8. *Facilities for Study.*—The service of the hospital to the cause of investigation and research is, I believe, unique, and in no field more so than that of syphilis. The struggle to do effective, basic, original work under the limitations of dispensary practice carries impossible odds. A shifting material, a hiatus between each two periods of observation, a line-up always pressing forward for more and more superficial attention, is no foundation for painstaking work. He is a hero who makes head against it. May the gods save us from the torrent of patients, the struggle with inadequate assistance, the sodden burial of our ideals under tons of routine. A service of even a few beds with a small laboratory and an organization that saves to its staff a few precious hours of leisure in which to mull over its patients, to know them, to sit on a stool and watch them, absorbed in thought, is a powerful force in the development of originality, and may be the nurse of genius.

The practical problems of organization of a bed service must vary with local conditions, and cannot be detailed in advance. They differ widely from those of the dispensary. If there is an attending physician, or if a clinician is invited to join the staff, the fewer his outside interests the better. As in many other fields of medicine, the advent of the full-time man will be, I believe, an advance worth the cost. When the senior is not on full time, I would urge a permanent resident who should be a student of the disease, living in the midst of it, and having the *savoir faire* and qualities of heart and mind which enable him to appreciate it as a social and psychologic as well as a medical problem. Rotating-service interns should study the disease only under his control and direction, and those with merely perfunctory attitudes of mind toward it should be carefully excluded.

A hospital service for syphilis may be pay or free. As the state grows to larger appreciation of its responsibilities, we may perhaps look forward to the latter ideal, now embodied in the Scandinavian and Italian systems, and foreshadowed for us in the action of the state of Michigan in its recent provisions for the care of sick children and adults. In the interregnum between *laissez faire* and this new ideal, however, there is a place for the pay service for those of moderate means, who usually fall heavily between the two stools of high-priced specialism and the charity clinic. Such a pay hospital clinic, limiting its field, is under the necessity of protecting itself on the one hand from "dead beats," and on the other from dissatisfied and unmanageable wealth. The requirement that a reasonable fraction of the fee, especially for sal-

varsan, be deposited in advance, disposes of many of the former, and is a proper feature of the business management, provided it be administered with such discretion that special distress and worthiness can have help occasionally.

The mechanics of operating a service in a hospital involve complexities that do not appear on the surface, and are more or less *sui generis*. The necessary protection of the incognito of the better and more sensitive types of patients flatly precludes herding or labeling methods. Venereal wards are as unsocial and unintelligent a provision for syphilis as a venereal hospital would be, and make hospital care a luxury limited to "down-and-outs." Self-respecting people will not avail themselves of it. The private room is the nearest approach to the ideal. On my service at Rochester I hope to develop this sort of care to a fine point, and thus far I have found that it makes an appeal. The suppression of gossip, careful guarding of correspondence, and protection of the records are all necessary. Prying eyes must be kept out. Privacy in treatment must be provided, doing away with salvarsan line-ups, etc., and the utmost care taken that when patients are thrown together, innocently infected and unsophisticated persons are not brought under the influence of black sheep. If isolation wards are used, it is a constant struggle to keep them from being stigmatized by gossip. Attention to these details makes the advantages of inpatient care, continuous or intermittent, available to all who deserve protection and consideration.

As a contagious disease, syphilis is, of course, a problem only in the primary and secondary stages. Even at its worst, its infectivity in the hospital is scarcely comparable to that of tuberculosis or even typhoid, since the organism has an extremely low vitality. In the hospital, dangerous syphilis is unrecognized syphilis, and against it the routine Wassermann test and the service for the disease are valuable protection. Patients with active syphilis should be confined to their rooms until after salvarsan has been administered. Their dishes should be phenolized or boiled. A "precautions" routine that I devised for the use of nurses describes the calomel prophylaxis provided in the medicine rooms in case of possible accidental inoculation, the dangers of the pricked glove, the immersion of thermometers, disinfection of instruments, and the buccal and anogenital lesions of the disease, with the risks involved in approaching them. Panic and syphilophobia in medical staff and nurses is occasionally ludicrous and sometimes exasperating, but controllable by a little tact and common sense.

Records, follow-up and outside medical cooperation should be integral parts of one another, and between the three it ought to be possible, in the ideal system, to obtain for any one case a complete panoramic picture of the disease from incidence to cure. Included in the record should be notes describing the character of the cooperation of both patient and outside physician. A generation of such records would be a priceless picture of the treatment of the disease in modern times, and an authentic and convincing basis for legislation looking to its social control. As a practical skeleton for such a system I have been interested in that in use for surgical cases in the Presbyterian Hospital, New York. The importance of social service and visiting nurses, especially in connection with familial syphilis, is easily appreciated."

Interdepartmental cooperation within the hospital is vital to the efficiency of a service for syphilis. The holding back of syphilitic cases by other clinics on the one hand, or the failure of the department for syphilis to extend ready cooperation outside of its own wards on the other, impairs efficiency. The creation of the department by voluntary act of the hospital staff, and unhesitating and complete transfer to it of all the responsibility for the care of syphilis is the sine qua non, and without it men of high caliber will not find it worth while to give the service their attention. On the other hand, the clinician in charge of the work should not lose sight of the wide clinical bearings of the disease, and should maintain the interest of his colleagues in the progress of their cases under his care as well as in the diagnosis.

I have found that gonorrhea can be handled satisfactorily by the department of genito-urinary surgery among adults in a general service, or as a complication of syphilis. In hospitals for children and in lying-in hospitals, it is a dangerous contagious disease, and should be managed with the rigidity observed for diphtheria. I recall an epidemic in a children's ward traced by inference to the visits of infected patients from a near-by maternity home. There is nothing more distressing than the way in which a pediatrician may wake up some morning to find half a dozen little girls in some seemingly well-managed ward ruined for life by gonorrheal vulvovaginitis. A large hospital adhering to the venereal classification placed some heredosyphilitic children in a ward in which there were cases of gonorrheal vulvovaginitis, in spite of the protests of the pediatrician, and calmly permitted the little syphilitic girls to add the vulvovaginitis to their woes. The arthritic complications of gonorrhea seem to me to be legitimately within the province of genito-urinary work, since prostatic manipulations, etc., may well be part of the treatment, and these demand special knowledge of the genito-urinary tract. The follow-up on gonorrhea is fully as essential as that on syphilis, and might well follow the same lines.

The problems of gonorrhea and syphilis are not to be handled by any one agency to the exclusion of all others. Each one has its place, and each its problems with which it must perforce deal. It is no more possible to rate such diseases exclusively as hospital problems than it is to regard them solely as dispensary problems. Only in proportion to its ability to fill its place in a cooperative scheme will the hospital find its greatest usefulness.

I have touched elsewhere[1] on the value of the hospital in the study of gonorrhea and syphilis as diseases, not only of the physical body, but of the social *milieu* in which we move. The effort to understand and get back to first causes in the ideals, the daily life and the mental outlook of the victims of these diseases is a basic part of a public health movement against them. The opportunities offered by the hospital for intimate personal contact can create in this field a new type of physician to succeed the old family doctor—a physician who, though a specially trained clinician, has not lost by that fact the insight into the fundamentals of human nature which marks the student of life as well as the student of medicine. The studies of men trained to such an outlook in this field will, I believe, contribute much to the prevention of "half-baked" and premature legislation. Moreover, they will be a factor in the positive and constructive, rather than in the merely negative and prohibitive point of view which must dominate any successful campaign.

COURT RULES CORPORATIONS NOT FOR PROFIT MAY ELECT TRUSTEES OR DIRECTORS OUTSIDE OF STATE

People ex rel Hoyne, vs. Lutz et al. } Heard, J.

Saturday, Dec. 16, 1916.

Present: Mr. Stedman and Mr. Scofield.

THE COURT:—The statute, of course, provides for several different kinds of corporations in this state, one of them being corporations for pecuniary profit, and another corporations not for pecuniary profit, and others, religious societies, etc., homestead societies and different societies under the law. The provisions of the law with reference to these different societies are all different. Of course, the old idea originally was that a corporation was simply confined to the state or sovereignty which gave it birth. That rule, of course, has been a great deal modified since that time.

It is suggested here that because a phase of this matter had been before the Appellate Court twice, that their decisions in those cases were binding here. If this were the same case, of course, the court would be absolutely bound by that case. I consider this is an entirely different case, and the decision of the Appellate Court in that case is not binding.

It is said that it is contrary to public policy to allow the trustees to be elected at meetings held outside of the state of Illinois. The public policy of the state, as I understand it, is to be found in its statutes and the decisions of the court;

1. Stokes, J. H.: The Inpatient Hospital in the Control and Study of Syphilis, Social Hyg., 207, ii, 1916.

so that on this subject we do not find that the contention is borne out that this is against public policy.

The provision of the constitution to which my attention is called simply applies to corporations for pecuniary profit, and not corporations or societies of this kind.

Section 32 of the statute provides: "Corporations, associations, and societies, not for pecuniary profit, formed under the provisions of this Act, may elect trustees, directors, or managers from the members thereof, in such manner, at such times and places, and for such periods, as may be provided by the certificate of incorporation, or in case such certificate does not contain such provisions, then, as may be provided by the by-laws, which trustees, directors, or managers shall have the control and management of the affairs and funds of the corporation, society or association. Said trustees, managers or directors, may, upon consent"—giving their duties.

The certificate of incorporation in this case said that the directors should be elected in such manner as provided by the by-laws, and the by-laws provided that—

Mr. Stedman:—I didn't so read it, if your Honor please. Counsel so stated it, but—never mind—that is not correct.

Mr. Scofield:—It is absolutely correct, and his statement—

Mr. Stedman:—I am not debating it.

Mr. Scofield.—His statement that it is not correct is as correct as his statement in regard to the Derry Council case.

THE COURT:—Here is the proposition: That construction would place a limitation upon this act which would destroy the usefulness, not only of this particular organization but of hundreds of other organizations of exactly the same kind, and among them some of the oldest and most established organizations there are in the country, which are carrying on their proceedings in exactly the same way.

There is not a day passes scarcely but what some national society meets here in the city of Chicago. Their usefulness depends on their meeting in different places throughout the United States. The American Bar Association meets in different places. The general bodies of all the different religious societies meet in different places throughout the country. There is scarcely any branch of trade but what has its national association meeting in different parts of the country.

Now, of course, it is contended that their habitat cannot be changed. Of course it cannot, but this is not a question of habitat. The habitat always remains the same, the domicile remains the same, but its place of exercise of its power may be somewhere outside of the state of Illinois.

I think that the demurrer should be sustained in this case. You can get up an order.

An appeal was requested and allowed.

Researches on Gas Gangrene

M. Weinberg (*Proc. Roy. Soc. Med.*, July, 1916) reports on the use of an active serum with the three most pathogenic organisms of gas gangrene—*Bacillus perfringens*, the *Vibrion septique* and *Bacillus œdematiens* in the treatment of gas gangrene. The serum was tried in fifteen cases. It was absolutely inefficacious in five cases of septicemia due to *B. perfringens;* but in five other cases, not complicated with septicemia, the intravenous injection of this serum was rapidly followed by amelioration of the symptoms both local and general. Weinberg says that his bacteriologic study has shown that the anti-*Bacillus perfringens* serum has had a favorable influence in those cases of gas gangrene in which *B. perfringens* was the chief pathogenic organism of the flora. Weinberg believes that the antitoxic serum obtained with the toxin of the *Vibrion septique* or *B. œdematiens* will have a greater preventive than curative action. From experiments on animals he found that these toxins become so rapidly attached to the nervous system that it is very difficult to cure an animal even as little as half an hour after one fatal dose of toxin has been injected intravenously. In the author's opinion the best practical method of dealing with such a case of gas gangrene is to inject immediately in the wound and the neighboring tissues a mixture of the serums of the three microbes mentioned above. A rapid bacteriologic investigation then made by an expert will show which serums must be continued.

Medicolegal

Two Illegally Practicing Medicine Cannot be Treated as a Joint Offense

(State vs. Hendricks et al. (Mo.), 187 S. W. R. 272)

The Kansas City Court of Appeals reverses a conviction of the defendants who were jointly indicted for practicing medicine without a license from the state board of health in violation of Section 8315 of the Revised Statutes of Missouri of 1909. The court says that the law does not provide for the issuance of a license to two persons to practice medicine jointly. The license to practice medicine must be procured by individuals. Each person must have his own license. Neither of the defendants could procure a license for the other, nor could the two obtain a license for a joint undertaking to practice medicine. Hence the case was not like those in which a license for a business is necessary and such license can be procured for a joint enterprise. In such case two or more, jointly carrying on that business without such a license, can be jointly indicted. But here the case is different. If two persons engage in the task of medically treating a sick person without a license, the two have not committed a joint offense, but each has committed a separate offense. If one of them has a license, he is not guilty; if both are without a license, then both are guilty, but each is guilty of his own offense, and not both guilty of one offense. The burden of the offense is in not having a license, and the failure to have a license is a purely personal matter. Failure to procure a license cannot be a joint, but is necessarily an individual, matter. The treating of the sick is not in itself an offense. It becomes so only through the personal default of the defendant who does not secure an individual license from the state board. To convict of a joint offense the act proved must be joint. That is, each must be guilty of that which the other does. The two must be guilty of one and the same offense. So, while there may be a joint participation in an act of treatment, there is no joint offense created, but the same treatment may constitute one or two offenses according to whether one or both of those giving the treatment is without a license.

Hospital Not Absolutely Bound to Prevent Necropsy

(Hasselbo v. vs. Mount Sinai Hospital (N. Y.), 159 N. Y. Supp. 876)

The Supreme Court of New York, Appellate Division, First Department, says that this action was by a widow for damages by reason of an unauthorized necropsy performed on her husband's body after he had died in the defendant's hospital. The plaintiff, however, not only failed to allege that the necropsy was performed by the defendant, or by any of its servants, or by its consent, knowledge, privity or procurement, but she expressly admitted by a demurrer that the person or persons performing the necropsy were not servants or agents of the defendant, and at the time the necropsy was performed were pursuing an independent calling, and were not then acting under the direction or instruction of the defendant. The question was, therefore, squarely presented whether or not the defendant owed an absolute duty to the plaintiff to protect her husband's body against a necropsy by any person whomsoever, and to deliver the body to her in the same condition in which it was immediately after death. The plaintiff insisted that the defendant was under such a duty. The court does not so understand the law. Certainly no reported case has gone to this extent. It is well settled that, in the absence of a contrary testamentary disposition, the right to the possession of the body of one who has died belongs to the surviving husband or wife or next of kin for purposes of preservation and burial, and that this right is infringed on by any one who unlawfully mutilates such a body without the consent of the person entitled to the possession thereof, and for a violation of this right damages may be recovered for the injury to the feelings and the mental suffering resulting from the unlawful act. In all the cases, however, in which such a right of action has been upheld, the person held liable has either been the one who committed the unlawful act, or one who caused or produced the necropsy

to be made. None of them, therefore, is authority for the proposition contended for by the plaintiff in this action. Nor did the defendant's action or nonaction as alleged fall within the purview of the New York penal law, which declares that "a person who makes, or causes or procures to be made, any dissection of the body of a human being, except by authority of law, or in pursuance of a permission given by the deceased, is guilty of a misdemeanor." Neither could the plaintiff's demurrer to the defense in this case be upheld by analogy to a case of a bailment of good, in which a warehouseman has received the goods in an undamaged condition and delivers them damaged. No obligation is imposed by law on the defendant, except to refrain from actively participating, by its servants or otherwise, in the unlawful mutilation of the body of a patient who dies within its walls, and from causing or procuring such a mutilation to take place. The order sustaining the demurrer is reversed and the demurrer overruled.

Unlawful Use of Mails in Scheme to Defraud

(Oesting vs. United States (U. S.), 234 Fed. R. 304)

The United States Circuit Court of Appeals, Ninth Circuit, affirms a conviction, under Section 215 of the Criminal Code of the United States, of Paul Oesting, alias Paul Allen, of using the mails in connection with a scheme to defraud. The indictment charged, in substance, that at a time and place named, under the name of Dr. Jordan, L. J. Jordan, Incorporated, and Jordan's Museum of Anatomy, a corporation organized and existing under and by virtue of the laws of the state of California, and under the guise of the said Jordan's Museum of Anatomy, the defendant devised a certain scheme or artifice to defraud, or for obtaining money by means of false pretenses, representations or promises, to be effected by means of the postoffice establishment of the United States, etc. The court finds no merit in any of the objections which were made to the indictment. Referring to the charge that the defendant, under the name and guise of "Dr. Jordan, L. J. Jordan, Incorporated, and Jordan Museum of Anatomy," devised a certain scheme and artifice to defraud, etc., the objection was made that the charge was equivalent to saying that a corporation conceived the scheme, and that the defendant was charged only with acting for the corporation. But no such meaning could be found in the language of the charge. It distinctly alleged that the defendant acted under the guise of a corporation, and that he conceived the scheme. It would make no difference whether there was or was not such a corporation, so long as the defendant devised the scheme to defraud, whether acting for the corporation or in his own behalf. But it was said that the scheme as alleged did not appear to be of a fraudulent nature, or calculated to deceive, and cases were cited to show what must be alleged in an indictment for obtaining money under false pretenses. But the rule in those cases has no application to a prosecution under Section 215 of the criminal code. That section does not require that the scheme should be fraudulent on its face. All that is necessary is that it be a scheme reasonably calculated to deceive persons of ordinary comprehension and prudence, and that the mail service of the United States be used and intended to be used in execution of the same. It was urged that, from advertising that "Jordan was a physician," etc., it did not follow that the defendant intended to claim that Jordan still existed at the time of the advertising, but merely that he was or had been a physician prior to that time. This may be passed by as a mere quibble on words. But it was said that, even supposing that the defendant did intend to advise well people that they needed medical treatment, it did not follow that he intended to defraud, because it is well known that there is a large class of well people who are hypochondriacs, and who are benefited by medical treatment through its effect on the mind. In answer to this fanciful suggestion, it was only necessary to point to the language of the indictment, which showed that the aim of the defendant's scheme, both by advertising and by correspondence, was to convince well people that they were ill, and that they needed treatment from the imaginary Dr. Jordan.

Society Proceedings

COMING MEETINGS

American Association of Anatomists, New York, Dec. 27-29.
American Physiological Society, New York, Dec. 28-30.
Society of American Bacteriologists, New Haven, Conn., Dec. 26.

PHILADELPHIA COUNTY MEDICAL SOCIETY

Meeting held Wednesday, Nov. 22, 1916

The President, DR. JOHN D. MCLEAN, in the Chair

SYMPOSIUM ON THE DRUG HABIT

The Legal Aspect of the Drug Habit Problem

MR. FRANCIS FISHER KANE: I want to call attention to certain provisions in the Harrison Narcotic Law and to two or three decisions of the courts in which these provisions have been construed, and then speak of the state bill proposed by the Philadelphia Narcotic Drug Committee and suggest additional requirements for incorporation into the bill. Observing the "selling" provision of the act, it is seen that while Congress does not specifically say that the physician shall be guilty of offense if he sells or gives away the drugs to an addict to gratify the appetite, yet careful reading of the section shows this to be the intent. The phrase "in the course of his professional practice only" can have but one meaning.

Three cases are cited in which the language of the provision has been interpreted. In one arising in the court for the Southern District of Ohio, a bill in equity had been filed to restrain the internal revenue officers from enforcing the law against doctors doing a mail order business, attempting to prescribe for patients at a distance, sending out preparations containing cocain. After a careful analysis of the act and a review of the regulations of the commissioner, Judge Sater says that physicians who register and pay the tax may only under certain conditions prescribe the particular drugs in the treatment of their patients, and that Congress has indicated in "unmistakable language" that the practice of the doctor "must be legitimate and professional." In a case arising in the Northern District of New York, Judge Ray decided that a physician who issues a prescription for drugs in an amount so large as to be utterly unreasonable is guilty of an offense under the law; also, that the dealer filling such prescription is likewise guilty. In the Eastern District of Pennsylvania the prosecution in a case was against a physician under the same selling provision of the act, and the court ruled favorably to the government on the words "in the course of his professional practice only."

One question arising under the "selling" section of the act is whether a physician may not be said to "sell," even though the only part played by him is the writing of a prescription coupled with the receipt of money. In a Virginia case the judge said that prescribing was the same as selling or dispensing. In a regulation issued by the commissioner of internal revenue it was stated that for the purposes of the act generally, prescribing, dispensing and distributing are synonymous terms. Regarding the responsibility of the druggist in these cases, it is contended that he is protected by the mere presentation of a prescription. The government, of course, contends that the druggist is not so protected. The Harrison act had to be drawn as a revenue measure in order that it might be constitutional and enforceable by the courts, Congress not having power to legislate directly for the purpose of safeguarding the health and morals of the public. Certain of the provisions are being attacked on constitutional grounds as well as the government's interpretation of them. We of the government, knowing the seriousness of the drug evil, hope that the state legislatures will by stringent state laws safeguard the health and morals of the people. With the knowledge that in Pennsylvania there is no effective legislation regarding morphin and other products of opium, the Philadelphia Narcotic Drug Committee has had a bill drawn to fill the serious omissions in the Harrison act. The

state courts are given direct control of the "possessor" who has got his drugs through illegitimate channels.

Ought we not to except from the provision of the act such "an habitual user" as the morphin addict, who, suffering from a chronic or incurable disease, needs the drug quite as much because of the disease as because of his habit? Would it not be well to allow the physician to frank the prescription, and permit it to be filled as often as may be necessary, provided the case be reported to the board of health, as any other addict? The provision would meet a class of cases comprising the aged and impecunious to be provided for in any intelligent scheme of legislation. There should be also the regulation of the sale of the hypodermic syringe and of the indiscriminate sale of paregoric. This indiscriminate sale of paregoric cannot be prevented so long as compounds containing not more than 2 grains of opium to the fluidounce may be sold without a physician's authority.

Relative Infrequency of the Habit Among the Middle and Upper Classes; Treatment and Final Results

DR. F. X. DERCUM: Long before the enactment of the Harrison Narcotic Law there had been a marked diminution in the number of users of drugs in the middle and upper classes. This I attribute largely to the influence of physicians, their indirect education of the community, and the general educational movement in public schools and through the press. Physicians of a generation ago were more prone to resort to hypodermic injections for the relief of symptoms than are physicians today. Detection of drug habits is not as a rule difficult. If a hypodermic injection is absolutely necessary today, it is usually combined with scopolamin hydrobromate, and a much smaller dose of morphin is required, thus greatly lessening the danger of establishing the habit. Occasionally, I have noted that a patient would make use of cocain to correct the effects of morphin, and in addition use alcohol to overcome the general depressing effects, in this way acquiring the so-called triple habit. I believe the Harrison law has been especially effective in reaching the poor and the dependent classes, especially the degenerate and criminal classes of the tenderloin. That it also protects the drug inebriates of the middle and upper classes there can be no doubt. In the treatment, a physiologic method of living should be instituted. The drug should be withdrawn rapidly when the general condition of the patient permits it; more gradually if there is grave impairment of the health. Elimination should be stimulated, and in the rapid withdrawal of morphin, brisk saline cathartics should be employed. Permanency of cure depends largely on the subsequent life of the individual. There should be abundant hours of rest, abundant food, exercise in the open air, and wholesome occupation. The habitué or alcoholic is usually not a normal person; frequently he is hereditarily neuropathic. The symptoms arising during the withdrawal of the drug are largely due to the unantagonized action of the accumulated antitoxin, the result of the long continued ingestion of morphin. The sweating, vomiting and diarrhea can be looked on only as efforts on the part of nature at elimination. The symptoms of withdrawal have an important diagnostic significance, for if these symptoms are absent and the patient is comfortable, sleeps well and is contented, then we know that he is obtaining the drug surreptitiously.

The Drug Habit and the Underworld

DR. FREDERICK S. BALDI: Eighty per cent. of drug habitués are from 12 to 30 years of age. Ninety-five per cent. of habitués are criminals by reason of the acquired habit. The keynote of the successful management of the habitual drug user is supervision. I do not believe in the so-called reduction cure; it is not the solution of the problem, and simply affords the victim the means of continuing the drug. Absolute and immediate withdrawal, the withholding of other drugs as substitutes, and hydrotherapy are the cardinal factors in a speedy recovery. This recovery will require twenty-four hours in mild cases and not more than from three to five days in the most severe cases. The patient should be fed and put to work under supervision. In our prison care of the habitué, no matter how long he has been addicted to the drug, he must take a cold shower bath, rub himself if able, and if not, be rubbed. He immediately goes to sleep and wakes asking for another bath. Gonorrheal and syphilitic infections are commonly associated with the drug habit; pulmonary tuberculosis and asthma are also frequent. Legislation regarding the habitué per se is absolutely useless. Legislation should rather be directed toward the producer of the drug. There should be state control of the drugs from the crude form to the finished product. Such control of the drug would render an institution unnecessary. The Harrison act has proved a failure. Whatever legislation is to be made on this subject, let the county medical society submit recommendations before a bill becomes a law, and not wait until the law is passed and then cry out that another injustice has been wrought on the medical profession. I differ from Dr. Dercum regarding the relative frequency of the drug habit among the middle and upper classes.

DISCUSSION ON THE DRUG HABIT

DR. JOHN H. W. RHEIN: I have had opportunity of treating many patients sent to the Polyclinic Hospital by Mr. Kane in connection with the operation of the Harrison act. The patients first sent were habitués of the tenderloin, forced to take the treatment from fear of arrest if they continued the habit. With some the drug was withdrawn successfully, and they left the hospital in a week or two in good condition; others resisted treatment and left in a day or two. At first we were rather encouraged with the results, finding through the social service that some of those treated remained away from the drug for from one to four weeks. These were later lost sight of. A second class was made up of those sent in by missionaries or social workers, not the tenderloin class, but those who went to the tenderloin but still tried to work. Some of these paid for semiprivate wards. Most of them stayed until the drug was entirely removed. They promised to return; and while many did, others were lost sight of. Those of the first class we may regard as hopeless; of the second class we may say there is some hope in a small percentage of cases. Our treatment was not so heroic as Dr. Baldi's. We gave them scopolamin and belladonna, and elimination was effected by calomel and salts for a couple of days. At the end of a week almost every patient was fairly comfortable. I have had several cases in which the patients had been taking the drug for twenty-five years, using a large dose hypodermically, whom I treated in this way without untoward results. I fully approve of restricting the sale of hypodermic syringes. The morphin habit dates from the introduction of the hypodermic syringe. The most rational way of curing the evil is the enactment of laws restricting the sale of the drug. While patients are well cared for in the general hospital, to have special wards would be ideal. The extent of the habit is very great, and it is mainly confined to the underworld. In an experience of twenty-six years I have had relatively few cases among the better classes. The real problem of the drug habit is the social problem of the tenderloin.

MR. CHRISTOPHER KOCH: I agree with Dr. Baldi that the best method of treatment is the entire withdrawal of the drug at once. The worst case I ever saw was that of a man, aged 35, who had had the habit for twenty years. We took the drug away from him entirely, and so long as he was under restraint he improved. Left to himself, however, he would return to the drug. I do not believe there is any cure for the habit. There seems to be a strong desire among habitués to spread the habit. Through the South, contracts are made with negro laborers to give them dope in order to obtain a greater amount of work. When from the effect of the drug they are unable to work, they are turned loose and a new bunch of colored labor is secured. A law to be effective should be prohibitive; the many "provisions" written into it emasculate it. If you want to curtail the dope habit, dispensing of drugs should be stopped. The manufacturer must be restricted. I believe that all these drugs should be prescribed by themselves; it is the mixtures that do the harm. Regarding the requirement of patients to register, I

do not see how the difficulty would be overcome of having them register with two physicians. If the state legalizes the reduction treatment, which I myself think is a mistake, there should be a central point of registration and for receiving the drugs.

DR. HOWARD W. HASSELL: I have not the slightest doubt that there is a cocain habit. The usual form of syringe of the chronic habitué is a rubber bulb from an eye dropper which he ties on a needle. Restricting the sale of the hypodermic syringe, therefore, would not affect him. Regarding the gradual reduction treatment, I do not believe you can treat a dope case in the office any more than you can treat the drunk case.

DR. H. C. WOOD, JR.: We do not kill people by abrupt withdrawal of the drug. In one case, the man could scarcely walk; the temperature by mouth was less than my thermometer would register; his weight was 95 pounds. He was sent to the hospital and was not given a grain of morphin or other opiate. In the first week he gained 10 pounds; the second, 8 pounds, and the third, 5. At no time were there symptoms to cause serious alarm. The most important problem before the society tonight is not the treatment of the individual, but the treatment of the community. The number of persons who can be cured of the drug habit is extremely small. Prevention of the spread of the drug habit is much more important to the community than the treatment of the individual. Federal legislation has failed to stop the sale of the drug because the United States government has no authority in the state of Pennsylvania to regulate the sale of morphin and cocain. We are behind the majority of the states of the Union in the matter of the control of the sale of narcotics. The influence of the medical profession back of the people is needed to secure adequate legislation in this matter.

DR. ALFRED GORDON: In a study of the effect of cocain and morphin from the neurologic and psychiatic standpoints I have concluded that the majority of cases are not curable. The most striking feature is the defective will power. I cannot subscribe to the abrupt withdrawal of the drug in all cases. Patients must be treated individually. Prevention is the most important consideration. To establish this we must find the cause, and this is usually within the individual himself.

DR. GEORGE E. PRICE: My experience with these cases has been confined to a comparatively small number in private practice and a rather large number in the Philadelphia General Hospital, where Dr. McIvor and I made an analysis of a series of cases. The type of case found there and our results corresponded well with Dr. Baldi's finding in his prison work, and those of Dr. Rhein in the hospital cases, except in the matter of immediate withdrawal. We found that we obtained the best results by withdrawing morphin in from two or three days to two weeks, except in one or two cases in which very large doses had been taken for many years and the patients were feeble. There is a cocain habit, but cocain can always be withdrawn abruptly. Patients at the Philadelphia Hospital included persons of 15, 16 and 17 years of age, nearly all dwellers in or frequenters of the tenderloin and from practically all walks of life. The average amount of morphin taken daily was 15 3/10 grains. The largest dose was 90 grains in one day. The cocain and heroin habit seem to be of recent origin in the tenderloin. That the patients were degenerates was found by the signs of developmental arrest in about 40 per cent. of cases. I agree with Dr. Rhein and Dr. Dercum that the habit in the upper and middle classes is becoming less frequent. There seems to be wide difference of opinion regarding the prognosis. One writer makes the statement that the cure of the morphin habit is as impossible as the cure of inoperable cancer. The so-called drug institutes claim from 80 to 90 per cent. of permanent recoveries. I am skeptical about these reports. In our hospital cases the same patients returned from three to five times. Many of them had been treated in these institutions. It is my experience in my private work that patients do not stay cured. The crux of the question lies not in the cure of the individual, but in striking at the root and getting at the supply. The only effectual method is that of having the patients under supervision and restraint. I would favor having a farm or place where these men might be kept for a reasonable time until their general health was built up and where they might be at least self-supporting.

On motion of Dr. H. C. Wood, Jr., consideration of the suggested antinarcotic act was referred to the board of directors with full power to represent the Philadelphia County Medical Society.

SOUTHERN MEDICAL ASSOCIATION

Tenth Annual Meeting, held at Atlanta, Ga., Nov. 13-16, 1916

The President, DR. ROBERT WILSON, JR., Charleston, S. C., in the Chair

Tuberculosis, a Disease of Children

DR. F. CLIFTON MOOR, Tallahassee, Fla.: All children under 5 should be protected, and measures should be taken to prevent the massive infection which is sure to occur when there is active disease in some member of the household. No mother with active disease should nurse her infant. Where home conditions are hopeless, the younger children should be removed to a preventorium. Bovine tuberculosis should be controlled by uniform state laws or, better still, by the federal government. In Florida there are thirteen tuberculosis nurses. During the first year of the present campaign 1,225 patients were seen by the visiting nurses, and up to September of this year, 2,781 patients have been visited and instructed in the principles of prevention. The average time between visits is four weeks. The families visited are interested, and really endeavor to follow instructions.

Treatment of Syphilis with Arsenical Preparations

DR. E. H. MARTIN, Hot Springs, Ark.: Salvarsan should be used in all persistent local infections without waiting for a positive Wassermann. In the administration of 6,377 intravenous doses of salvarsan to 1,776 patients, I had only thirty-two instances of angioneurotic edema of sufficient severity to interfere with the administration of the salvarsan; there were only forty-two cases of rash following in from two to seven days thereafter, and only six instances of hemolysis, only three of which were of sufficient severity to cause a chill and jaundice; and only four cases of severe kidney congestion.

Health Insurance: Its Relation to the Medical Profession

DR. B. S. WARREN, Washington, D. C.: The bills proposed for enactment by legislatures have not provided in any way for a preventive medical service. They contain no authority for organizing health machinery or for utilizing existing health agencies. An excellent opportunity is offered by which the specialist in preventive medicine could be introduced into the plan through the administration of the medical benefits. It would be a simple matter to provide that the medical referee be a medical officer of the health department, and employed by that department after careful examination as to his knowledge of preventive medicine as well as skill in diagnosis. This would bring to the service of the health insurance system a corps of trained specialists clothed with all the authority of the health department.

Meckel's Diverticulum, with Special Reference to Umbilical Disorders of Infancy

DR. R. M. HARBIN, Rome, Ga.: These patients frequently furnish a history of umbilical disorder in infancy, and of having been irritable, colicky babies. There is a history of constipation, with the occasional presence of bloody mucus in the stool, causing straining. There usually has been pain around the navel, aggravated by running or pressure from the outside, an inability to expel gas, and bilious attacks without obvious cause.

Importance of Time in the Treatment of Tuberculosis

DR. WILLIAM REDIN KIRK, Hendersonville, N. C.: The time spent in arriving at a diagnosis is not lost. After the diagnosis has been made, no time should be lost before com-

mencing treatment. It is economy in both time and money to send the patient from home for treatment under competent supervision.

Transmissibility of Pellagra

DR. JOSEPH GOLDBERGER, Washington, D. C.: Our experiments furnish no support for the view that pellagra is a communicable disease; they materially strengthen the conclusion that it is a disease essentially of dietary origin, brought about by a faulty, probably deficient, diet.

Diagnosis of Pellagra

DR. M. L. GRAVES, Galveston, Texas: Many symptoms, isolated and unsupported, are suggestive of pellagra and may afford much strong suspicion of the disease, and with combination of two or more symptoms may amount to certainty. Neither the mouth secretions, the blood, the spinal fluid, the gastric contents nor the stools have yet given any conclusive evidence of this disease. Until they, one or more, do give such evidence or some definite etiologic agent is discovered, we shall be compelled to rely on the clinical aspects of the disease for the diagnosis.

Limited Artificial Pneumothorax

DR. C. M. HENDRICKS, El Paso, Texas: The disadvantages of partial collapse are few: Refills are necessarily more often; these patients must be studied and examined very closely, both by physical examination and the fluoroscope, in order to determine the time for refills; the frequency of the refills requires only that one be careful of his technic, as the more often the pleura is entered there is an increased liability to infection, air embolism and pleural shock. The advantages of this method are: There is less tendency to pleural effusions; very little strain is thrown on the right heart; there is no disturbance of the mediastinum; there is less danger of spontaneous pneumothorax and of rupturing an abscess into the pleural cavity; when the disease is arrested, the unaffected portion of lung is performing its function.

Early Recognition of Pulmonary Tuberculosis

DR. WALLACE J. DUREL, New Orleans: In the diagnosis of early pulmonary tuberculosis, one must separate the active incipient tuberculosis with clinical symptoms, such as slight fever, instability and acceleration of the pulse, dyspepsia, loss of weight, chills and night sweats, hemoptysis, etc., from latent incipient tuberculosis, in which the physical findings denote a lesion in the lungs, but with none of the cardinal clinical symptoms indicating active or progressive tuberculosis.

Rôle of Food in the Etiology of Cardiovascular-Renal Disease

DR. ALLAN EUSTIS, New Orleans: In cases of cardiovascular-renal disease, intestinal toxemia may contribute to the severity of the symptoms and should be considered in the management of all cases. Excessive protein food, irrespective of intestinal toxemia, overworks the kidney and is at least a predisposing cause of cardiovascular-renal disease.

Prognosis in Cardiovascular-Renal Disease

DR. GEORGE DOCK, St. Louis: A bad prognosis should not be given at the first examination unless the evidences of heart failure are well marked, or unless there is advanced arteriosclerosis, strong suspicion of coronary artery disease, and evidence of severe renal insufficiency or other dangerous organic disease. Even then, rest and appropriate treatment may modify the outlook. When loss of compensation occurs, the prognosis can be greatly aided by the careful observation of the effect of treatment, and the degree of functional power regained. No matter how complete the incompensation, a hopeless prognosis as to improvement in a given attack should not be made, for patients not rarely seem to be moribund and then recover to a surprising degree and remain so for months.

Local Health Work Under State Board Supervision

DR. G. M. COOPER, Raleigh, N. C.: When a county contains a city of more than 10,000 people there should be a thoroughly organized health department with a graduate physician who has had experience in public health work at the head. There should be at least four school and public health nurses, a food inspector and a second physician to look after medical cases. In small, poor counties, certain units of health work can best be done under state board supervision. This arrangement makes for low per capita cost, effective work and efficiency, and removes health work from the field of petty politics. A free dental and medical dispensary with the county as unit ought to be provided for.

Treatment of the More Common Fractures

DR. LUCIUS E. BURCH, Nashville, Tenn.: The injured should always be compared with the uninjured member. The diagnosis should be checked up with roentgenograms taken anteroposteriorly and laterally. Splints are for the purpose of immobilization and not for reduction. An anesthetic should be used when fractures are being reduced. Tight bandages should be avoided. Massage and passive motion should be started at an early date.

Diaphragmatic Hernia

DR. JAMES F. MITCHELL, Washington, D. C.: There are two routes of approach, the thoracic and the abdominal. In acute injuries the abdominal route offers the advantage of better inspection and safer repair of wounds of the abdominal viscera. The thoracic route is indicated in recent stab wounds which have penetrated the chest, and the nature of the incision depends largely on the wound. Simple enlargement of the wound with resection of a rib or two may be all that is necessary to enable the operator to replace the herniated abdominal organs and repair the injured diaphragm.

Tumor of the Mammae

DR. E. B. CLAYBROOK, Cumberland, Md.: We should say to all men and to all people that all lumps in the breast are potentially, if not actually, malignant, and the breast should be sacrified, and the axilla cleaned out regardless of sentimental considerations as to diagnosis and the loss of the breast. If we do this, it will not be long until our cancer statistics will be different, and the woman with a lump in her breast will not hide it from her friends and from her doctor, but will come and have it out.

Extraperitoneal Cesarean Section

DR. W. KOHLMANN, New Orleans: I have performed six sections, five of which were extraperitoneal, and one transperitoneal, with clamps. Notwithstanding the fact that the absolute extraperitoneal route is more difficult and requires more time, a fact which is of great importance, especially in cases in which the patients are exposed to long and protracted labor, this procedure seems to offer some rather important advantages: The safety of the patient will be greatly insured; the bleeding from the thinned out cervical walls is greatly diminished, and the operation will not be complicated by intraperitoneal adhesions.

Neglected Appendicitis

DR. JERE L. CROOK, Jackson, Tenn.: I am confident that the task of teaching the people that this disease is a surgical one, demanding prompt operation, would be far easier than convincing them that pure air and good food cure consumption. By the time that the people have learned their lesson we may expect to have the diagnosis and treatment so standardized in the minds of both internists and operators that the so-called medical treatment of appendicitis will be but a doleful memory, and neglected cases only those in which the patients refuse to heed the advice of their physicians and have closed their eyes and ears to facts set forth by the campaign to teach the people the nature and treatment of this disease.

Suction Drainage in Empyema

DR. ALEXIUS MCGLANNAN, Baltimore: I have treated twenty-four cases of acute empyema by suction drainage. For comparison I have taken an equal number of cases treated by ordinary drainage during the years immediately preceding 1914. Four patients died, a mortality of about 17

per cent. In one of the fatal cases the empyema was part of a general pyemia following lateral sinus thrombosis, and in another, death was caused by a complicating cerebral abscess. The mortality rate in the earlier series was 25 per cent., and here again one fatal result was due to cerebral abscess. Both cases of cerebral involvement were proved by operation, and in one case necropsy showed a hemorrhage about a thrombus at a distance from the abscess. There were no fistulas or secondary operations in the suction cases. In the earlier series there were two cases requiring secondary operations. The average time required for complete healing with suction drainage was thirty-eight days. Omitting the two cases in which secondary operation was required, the average time of healing with ordinary drainage was eighty-four days.

Basal Cell Cancers of the Skin

DR. H. H. HAZEN, Washington, D. C.: There are two distinct types of skin cancer, the basal cell and the prickle cell. These two types run different clinical courses, and must be treated along different lines. Basal cell tumors usually spring from pathologic conditions of the skin, of which the senile keratosis is the commonest. Removal of these precancerous lesions would prevent most cases of cancer. Basal cell cancers usually spring from the basal layer of the rete, and may be multicentric in origin. The disease is more common in men than in women, and negroes are but exceptionally affected. While the disease not infrequently starts during the fourth decade of life, it is most common in the fifth and sixth decades. Basal cell tumors are most commonly situated on the skin of the face, where the majority of all cancers are of this character. They are extremely uncommon on the limbs, and are rare on the trunk. Only a small percentage of them metastasize to the neighboring glands, and hence local removal is usually sufficient to effect a cure. In early growths, competent surgery should cure well over 95 per cent. of all patients, while in late growths surgery will cure a fair number.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

December, XII, No. 6

1 Obstetric Paralysis; Report of Four Hundred and Seventy Cases. J. W. Sever, Boston.—p. 541.
2 *Topography of Pulmonary Fissures and Lobes in Infants with Special Reference to Thoracentesis. J. C. Gittings, G. Fetterolf and A. G. Mitchell, Philadelphia.—p. 579.
3 *Fresh Moving and Cool Outdoor Air in Pediatric Practice. R. G. Freeman, New York.—p. 590.
4 Case of Infantilism Due to Hypopituitarism. H. Climenko, New York.—p. 597.
5 Transient Abdominal Tumor in Child of Five Years with Redundant Colon. G. N. Acker and E. P. Copeland, Washington, D. C.—p. 602.
6 *Congenital Obliteration of Aorta; Report of Case. H. Gauss, Chicago.—p. 606.
7 *Use of Cream and Precipitated Casein in Indigestion with Fermentation. J. I. Grover, Boston.—p. 612.
8 Suggestion as Therapeutic Measure in Nocturnal Enuresis. F. L. Dunham, Baltimore.—p. 618.
9 Review of Literature of Respiratory Diseases of Past Year. C. H. Smith, New York.—p. 626.

2. **Topography of Pulmonary Fissures and Lobes in Infants.**—As the lower level of the lungs in infants and probably in young children does not extend quite so low as in adults, and owing to the anatomic characteristics of the bases of the pleural cavities in early life, the authors urge that great care should be exercised to avoid damage to the diaphragm in performing thoracentesis. The sixth interspace in the midthoracic line and the seventh or possibly the eighth interspace in the line of the angle of the scapula (at rest) represents the lowest limits of absolute safety for thoracentesis in early life.

3. **Fresh Air in Pediatric Practice.**—Fresh moving and cool outdoor air, Freeman says, is an agent of wonderful power and value to the pediatrician. It stimulates the appetite, induces quiet sleep, brings color to the cheeks, and increases the resistance of the organism to infection. The cold air of winter is much more stimulating and produces better results in children than the mild air of spring and autumn. The best results from fresh air are obtained by keeping the children out of doors day and night. These children are not subject to colds which others have during the winters; they have good color, good appetite and a normal, robust development. Outdoor sleeping porches enclosed on three sides and roofed, but open to the south, furnish the best fresh air at night, while in the daytime balconies and rooms without heat and windows wide open supply the air needed.

Where it is impossible to obtain complete outdoor exposure, substitute in cold weather rooms with cheesecloth screens in the windows. Other methods of ventilation consist in patent ventilators put under the lower sash. These, however, allow more movement in the air of the room, but less open space, and some of them furnish no filtration of the dust from the air. The most important application of fresh-air treatment is to build up the vitality and resistance to disease of frail children. This is true in early life, for children with marasmus and malnutrition who are impossible to feed so as to obtain an increase in weight will often gain promptly, with no change in food, on being kept out of doors or in front of an open window in winter. In all the acute infectious diseases, Freeman says, there is now a general acceptance of the advantage of fresh air, excepting perhaps in measles and scarlet fever, although he has convinced himself that measles and scarlet fever are no exceptions. He has put patients during a severe measles epidemic complicating scarlet fever out of doors in winter without a single fatality, although some of the scarlet-fever patients were exceedingly sick when the change was made. The change to outdoor air seemed to help them all. The common colds of winter are favorably influenced by cold, fresh air, as are other forms of infections.

6. **Congenital Obliteration of Aorta.**—The anatomic diagnosis in Gauss' case was: congenital atresia of the aorta at the orifice; total absence of the aortic valves; hypertrophy of left ventricular wall; dilatation of the right ventricle; common opening of the coronary arteries. The specimen was encountered in a routine postmortem examination. The heart was slightly enlarged. The apex was made up of the right ventricle, which was appreciably larger than the left. The auricles and the coronary sinuses were distended with blood. The pulmonary artery was considerably larger than the aorta. From the ventricular cavity there was no opening into the aorta; but at the site of the aorta there was a small pinpoint retraction of the endocardium, and there was no evidence of the aortic valves. The aorta was completely closed for a distance of 2 cm.; beyond this point it dilated and reached its normal diameter at the junction of the ductus arteriosus. The closed aorta was 2 mm. wide. The coronary arteries opened into the left ventricular cavity by a common orifice near the site of the aorta close to the interventricular septum. The ductus arteriosus and the foramen ovale were widely patent.

7. **Cream and Casein in Indigestion with Fermentation.**—Nothing is claimed by Grover for the precipitated casein in this method of feeding except that it makes possible a very low carbohydrate food, it being almost lactose free. Many cases of indigestion with fermentation are brought about by dispensing with the disturbing sugar. In Grover's opinion the symptoms would clear up faster and surer if all the carbohydrates were reduced to a minimum for a while, and then a different one gradually substituted for the one that caused the disturbance. In treating fat intolerance try at first to give a food free from fat, and gradually build up a tolerance. It seems, therefore, reasonable in treating carbohydrate indigestion to get the carbohydrate as low as possible for a while, and gradually build up a tolerance. It is interesting to note in this series how well each baby took fat up to 2 per

cent., 2.5 per cent. and even 3 per cent., while on the low lactose formulas.

American Journal of Roentgenology, New York

November, III, No. 11

10 Roentgenology of Heart. A. W. Crane, Kalamazoo, Mich.—p. 513.
11 *Roentgen Diagnosis of Bronchiectasis. A. B. Moore, Rochester, Minn.—p. 524.
12 *Capillary Circulation in Roentgenogram of Chest. J. G. van Zwaluwenburg, Ann Arbor, Mich.—p. 532.
13 Scarf Pin in Right Lung. P. M. Hickey, Detroit.—p. 536.
14 Case of Arteriosclerosis. R. C. Mahaney, Owosso, Mich.—p. 537.

11 and 12. Abstracted in THE JOURNAL, Nov. 18, 1916, p. 1549.

Boston Medical and Surgical Journal

November 30, CLXXV, No. 22

15 *Clinical Study of Secretions of Digestive Tract. T. R. Brown, Baltimore.—p. 775.
16 Psychic and Neuropsychic Affections in War. E. Régis, Bordeaux, France.—p. 784.
17 Drug Addiction and Modern Methods for Its Control. S. H. Rubin, Boston.—p. 792.
18 Acute Primary "Idiopathic" Phlegmonous Gastritis; Report of Case. E. B. Fink, Chicago.—p. 795.

December 7, No. 23

19 Preparedness for Health. H. Emerson, New York.—p. 811.
20 *Spinal Fluid Sugar. J. B. Rieger and H. C. Solomon, Boston. —p. 817.
21 Outline of Elements and Treatment of Stammering. A. B. Stedman, Brookline.—p. 818.
22 Fatty Degenerative Changes in Purkinje Cell Belt of Cerebellum in Exhaustive Infective Psychoses. E. W. Fell, Elgin, Ill.—p. 819.
23 Yerkes-Bridges Point Scale as Applied to Candidates for Employment at Psychopathic Hospital. C. S. Rossy, Boston.—p. 822.
24 Intensive Group of Social Service Cases. M. C. Jarrett, Boston. —p. 824.
25 Expedient for Radical Cure of Some Retroversions. E. Reynolds, Boston.—p. 830.
26 Ether Anesthesia. H. H. Amsden, Concord, N. H.—p. 832.

15. **Secretions of Digestive Tract.**—From his studies Brown draws certain conclusions—some of purely physiologic, others of clinical interest. Of the former the most interesting were the demonstration of the lack of influence of the gastric secretion on the character of the saliva; the fact that a saliva rich in diastatic ferment is secreted during the chewing of inert substances, stimulating neither to the senses of taste nor smell, the independence of rennin and pepsin, the lack of definite quantitative relationship between the pepsin and the hydrochloric acid of the digestive juice, and the proof that in the absence of the normal mechanism of pancreatic stimulation some other mode of calling forth the ferment of this gland, probably nervous in character, is called into play. From the clinical side, although also of physiologic interest, the conclusions of interest are the large number of conditions in which an absence of hydrochloric acid in the gastric juice is met, and the importance of the appreciation of this fact both diagnostically and therapeutically; the significance of an increase in the soluble protein of the gastric contents in the diagnosis of gastric carcinoma; the importance of recognizing the group of gastrogenous diarrheas, and the brilliancy of their treatment with hydrochloric acid; the fact that with a rigorous technic there are low normal limits to the quantity of diastase found in the stool, and that an absence of these ferments is very suggestive of cancer of the pancreas.

20. **Spinal Fluid Sugar.**—Estimations of the reducing sugar content of the spinal fluids of 175 subjects, in the main, psychopathic, gave values ranging from 0.050 to 0.090, or a grand average of 0.070 per cent. The extremes obtained in certain diabetic and inflammatory conditions are not here included. In general, the higher values have always been found in the more robust subjects, and aside from this, the range is the same in the psychopath as in the nonpsychopath, in the male as in the female, and the young as in the old. The diagnoses made on these subjects are general paresis, 47; dementia praecox, 30; alcoholism, 22; manic depressive insanity, 12; epilepsy, 6; diabetes, 6; juvenile cerebrospinal syphilis, 4; adult cerebrospinal syphilis, 5; arteriosclerosis, 4; pellagra, 2; tuberculous meningitis, 1; hypopituitarism, 1; chorea, 2; tabes, 4; miscellaneous psychoses, 20; not insane, 10. On this basis the following values are remarkable; diabetes, 0.134 to 256 per cent.; pellagra, 0.90 to 0.102 per cent.; two of the more severe cases of cerebrospinal syphilis, 0.044 to 0.048 per cent.; tuberculous meningitis, 0.026 per cent.

Cleveland Medical Journal

October XV, No. 10

27 *Transplantation of Ureters; Report of Cases. W. E. Lower, Cleveland.—p. 629.
28 Diseases of Colliculus Seminalis; Report of Case. A. Strauss, Cleveland.—p. 636.
29 Use of Radium in Dermatology. H. N. Cole, Cleveland.—p. 645.
30 *Report of Complement Fixation Test for Gonorrhea. T. P. Shupe, Cleveland.—p. 652.
31 Skookum Chuck. H. F. Biggar, Cleveland.—p. 656.

27. **Transplantation of Ureters.**—In one case cited by Lower a woman, aged 47, who had a history of several unsuccessful attempts to repair a vesicovaginal fistula, which had resulted from the removal of a malignant uterus, transplantation of the ureters into the loin brought her relief from the urinary incontinence. A boy, 9 years of age, had exstrophy of the bladder. The ureters were transplanted into the rectum, with an interval of about two weeks between the two operations. At a still later time, a plastic operation made the boy more comfortable. In a third case, one of carcinoma of the bladder, which was inoperable intravesically, the ureters were transplanted into the rectum at different times, and later the bladder was completely extirpated. Six weeks after operation, the man was in good health, had regained practically all the weight he had lost, and had no special discomfort. In none of these cases was there any resulting incontinence.

30. **Complement Fixation Test for Gonorrhea.**—In a series of 1,000 tests made by Shupe, no case was found in which the result was positive when the patient had not been infected with the gonococcus or did not have gonococci vaccine. In acute cases, when it is very easy to demonstrate the presence of gonococci, the fixation test is generally negative in the first five weeks and becomes positive from the fifth to the sixth week in uncomplicated cases. If the infection remains limited to the anterior urethra and subsides by the seventh or eighth week, the patient may never have a positive reaction. A positive reaction occurring in a person clinically cured of gonorrhea indicates the presence of a gonococcus focus, and these persons are potentially capable of infecting others. The antibodies may remain for five or six weeks after all organisms have disappeared and a negative test following a positive one in a supposedly cured case is good evidence that the patient is cured. About 30 per cent. in this series were positive when supposed to be cured. Shupe has found that the test is of particular value in gonorrheal arthritis. It is about 100 per cent. positive in this class. In acute epididymitis, after five weeks from the onset of the disease, it is 100 per cent. positive. Chronic prostatitis, seminal vesiculitis and posterior urethritis give 80 per cent. positive reaction. An uncomplicated stricture does not give a positive result. An individual may have two or more infections and in interpreting a positive test it should be borne in mind that gonorrhea is a very widespread disease.

Delaware State Medical Journal, Wilmington

October, VII, No. 11

32 Women and Tobacco. C. B. Towns, New York.—p. 3.
33 Psoriasis. G. C. McElfatrick, Wilmington.—p. 5.
34 Cystic Odontoma. W. E. Bird, Wilmington.—p. 8.

Journal of Bacteriology, Baltimore

November, I, No. 6

35 Nomenclature and Classification of Bacteria. R. E. Buchanan, Ames, Iowa.—p. 591.
36 Oxygen Requirements of Biologic Soil Processes. T. J. Murray, Blacksburg, Va.—p. 597.
37 Preparation of Culture Media from Whole Blood. R. A. Kelser, Washington, D. C.—p. 615.
38 Classification of Some Lactose Fermenting Bacteria. M. Levine, Ames, Iowa.—p. 619.
39 New Ice Sampler. M. Greenfield, Lawrence, Kan.—p. 623.
40 Apparent Recovery of Hen Infected with Bacillary White Diarrhea. G. D. Horton.—p. 625.

41 Influence of the Chemistry of the Culture Medium on the Indol Production of B. Coli and B. Typhosus. E. Zunz and P. György, Brussels.—p. 627.
42 Some Regulating Factors in Bacterial Metabolism. I. J. Kligler, New York.—p. 663.

Journal of Cancer Research, Baltimore

October, I, No. 4

43 *Effects of Cancer Tissue, Embryonic Tissue and Normal Tissue on Vitality of Protozoa. G. N. Calkins, New York.—p. 399.
44 *Mode of Origin of Fibro-Adenoma of Mammary Gland in Rat; Delayed Retrogression of Mammary Gland After Lactation. L. Loeb, St. Louis.—p. 415.
45 *Transplantation of Benign Tumors. L. Loeb and M. S. Fleisher, St. Louis.—p. 427.
46 Primary Carcinoma of Ureter; Report of Case. E. C. Schmitt, Chicago.—p. 461.
47 *Inheritability of Spontaneous Tumors of Specific Organs and of Specific Types in Mice. M. Slye, Chicago.—p. 479.
48 *Inheritability of Spontaneous Tumors of Liver in Mice. M. Slye, Chicago.—p. 503.

43. **Effects of Cancer Tissue on Protozoa.**—The general results of Calkins' experiments confirm conclusions previously reached, that a lethal factor is present in cancer tissue which is absent in normal tissue.

44. **Fibroadenoma of Mammary Gland of Rat.**—Loeb's observations constitute a further argument in favor of the view that in certain cases cirrhotic conditions of an organ may not be of a substitute character, but rather the result of a direct stimulating effect exerted by the epithelium on the connective tissue, under conditions which favor the production of fibers by the fibroblasts rather than the integrity or multiplication of the connective tissue cells.

45. **Transplantation of Benign Tumors.**—From their studies Loeb and Fleisher conclude that it is possible to transplant benign tumors, specifically the adenofibroma of the mammary gland of rats, through several generations, but there is an apparent decrease in the growth energy in each successive generation. Sarcoma as well as carcinoma generally show on transplantation a definite increase in growth energy, which is not dependent on a selection of the most virulent cells, as Ehrlich maintained, but on a direct stimulation of the tumor cells by the conditions associated with transplantation. The curve of this increase differs in different tumors. In the case of the benign tumor there is a certain variability in the results of transplantation in the first as well as in the succeeding generations. At various periods after transplantation mitotic figures can be found, which are occasionally more numerous in the connective tissue than in the epithelial structures. Exactly as with malignant tumors, there is also among benign tumors a difference in transplantability; some appear to be more readily transplantable than others. Those pieces of adenofibromas which do not grow after transplantation seem at least to remain alive for a considerable period of time. Two purely fibromatous tumors, the second of which approached a sarcomatous nature, were not successfully transplanted into other rats. The transplantation of adenomafibroma of mammary gland into pregnant rats seems to favor its growth during the period of pregnancy, much as the growth of the transplanted normal mammary gland is favored through pregnancy. If, on the other hand, carcinoma of the mammary gland of the mouse is transplanted into other pregnant mice, it usually does not grow.

47 and 48. **Spontaneous Tumors of Specific Organs in Mice.**—The results thus far obtained in the laboratory in which Slye is working, basing the conclusions on over 14,000 necropsies and on over 2,500 primary neoplasms, show (1) that in every case (not merely in selected cases) where there are sufficient data for study, tumors of specific organs and of specific types persistently occur in strains whose ancestry has furnished that type of tumor, and (2) they rarely or never occur in strains whose ancestry has not furnished that type of tumor, even where the strain carries 100 per cent. of cancer.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

November, IX, No. 2

49 *Secretion of Lymph. H. Yanagawa, London.—p. 75.
50 Trichlor Tertiarybutyl Alcohol (Chloretone) Anesthesia. L. W. Rowe, Detroit.—p. 107.
51 Pharmacology of Seminal Vesicles. J. A. Waddell, Charlottesville, Va.—p. 113.
52 Action of Opium Alkaloids on Ducts of Testis. D. I. Macht, Baltimore.—p. 121.

49. **Secretion of Lymph.**—Narcotics (ether and alcohol), Yanagawa says, increase the lymph, which becomes more concentrated and of higher osmotic pressure, but is reduced in its coagulability. The higher arterial pressure and the greater rapidity of the blood circulation through the organs under strophanthin does not influence the lymph flow; the intracapillary pressure in the portal veins is not increased by it. After the injection of epinephrin the lymph increases parallel wih the rise of the arterial pressure, and here the intracapillary pressure is also increased. Arsenic increases the lymph, diphtheria toxin augments the lymph greatly, with the changes in its composition characteristic of the lymphagogues of the first class. Calcium chlorid does not reduce the lymph flow under normal conditions, but acts in the same way as the other salts. Calomel and its double salts injected subcutaneously do not cause any significant hydremic plethora and do not increase the lymph. The intravenous injection of acids (lactic acid, oxybutyric acid), in quantities insufficient to cause marked poisoning, does not affect the lymph flow. The effect of alkalies (sodium bicarbonate, limewater), can not be distinguished from that of neutral salts. Pilocarpin increases and atropin reduces the activity of liver cells as measured by the bile flow, and the lymph after pilocarpin is augmented, while after atropin it is sometimes increased and sometimes unchanged. Quinin has no distinct effect on the lymph flow, except when sufficient is given to cause fatal intoxication. The flow of the lymph does not always run parallel to that of the bile; sometimes they are influenced in opposite directions.

Kentucky Medical Journal, Bowling Green

November, XIV, No. 11

53 Future of Medical Profession in Kentucky. E. A. Stevens, Mayfield.—p. 560.
54 Then and Now in Surgery. W. L. Gambill, Jenkins.—p. 564.
55 *Nontuberculous Infections of Kidney. C. G. Hoffman, Louisville.—p. 568.
56 Relationship of Feeding in Infantile Eczema. M. L. Ravitch and S. A. Steinberg, Louisville.—p. 576.
57 Infantile Paralysis. J. Glahn. Owensboro.—579.
58 Case of Splenomegaly of Inherited Syphilis. C. A. Vance, Lexington.—p. 583.
59 Summer Diarrhea. F. G. Carroll, Cave City.—p. 584.
60 *Functional Heart Diseases; What Are They and How Treated? B. B. Keys, Murray.—p. 585.
61 Case of Perforated Duodenal Ulcer. J. S. Lutz, Louisville.—p. 587.
62 Treatment of Tuberculosis. T. J. Townsend, Owensboro.—p. 588.
63 Inguinal Hernia; Herniotomy; Report of Cases. R. L. Schroader, Owensboro.—p. 590.
64 Acute Bright's Disease. S. M. Hopkins, De Mossville.—p. 594.
65 Camp Sanitation of Kentucky Troops. R. C. Adams, Salyersville.—p. 595.

December, XIV, No. 12

66 Acidosis; Its Determination, Significance and Treatment. E. F. Horine, Louisville.—p. 650.
67 Expectorants; Mode of Action and Symptomatic Indications. C. Norfleet, Somerset.—p. 652.
68 Excision and Immediate Closure Operation for Anorectal Fistula. B. Asman, Louisville.—p. 654.

55 and 60. Abstracted in The Journal, Dec. 2, 1916, pp. 1692 and 1693.

Medical Record, New York

December 2, XC, No. 23

69 Consideration of Intestinal Toxemias from Standpoint of Physiologic Surgery. J. M. Lynch and J. W. Draper, New York.—p. 969.
70 Dangers and Complications of Tonsillectomy. S. E. Moore, Minneapolis.—p. 972.
71 Syphilis Problem Among Confined Criminals. E. N. Boudreau, Auburn.—p. 981.
72 Lupus Erythematosus and Tuberculosis. L. B. Mount, Albany.—p. 983.
73 Sexual Development and Ductless Glands. S. Block, Brooklyn.—p. 984.
74 Albinism, Leukoderma, Vitiligo. J. E. Lane, New Haven, Conn.—p. 986.
75 Researches in Trichinosis. W. Lintz, Brooklyn.—p. 987.

Missouri State Medical Association Journal, St. Louis

December, XIII, No. 12

76 Two Hundred Routine Fracture Cases. C. E. Syndman, St. Louis.—p. 573.
77 Transplantation of Bone. E. F. Robinson, Kansas City.—p. 579.
78 Factors Tending Toward Accuracy in Clinical Diagnosis. W. W. Graves, St. Louis.—p. 581.
79 Spinal Cord Neoplasms. A. L. Skoog, Kansas City.—p. 585.
80 Experiences in Subdermal Medication. J. J. Gaines, Excelsior Springs.—p. 587.
81 *Rural Sanitation. J. C. Boone, Charleston.—p. 590.
82 *Unusual Case of Status Epilepticus. F. L. Long, Farmington.—p. 592.

81. Abstracted in THE JOURNAL, June 24, 1916, p. 2121.

82. **Congenital Epilepsy.**—A male, aged 20, victim of congenital epilepsy, was slightly paralyzed on the right side, which dated from birth, and it was presumed that the resulting condition was caused by birth paralysis. He had major convulsions regularly, averaging several per week. About three months before death he had an attack of serial epilepsy lasting about a week, during which time he had nearly 200 convulsions. During the last eleven and one-half days of life he had 2,031 convulsions. During this period he had several lucid intervals, lasting a few hours, at which time he took some nourishment. On several occasions his temperature rose to 103 but did not last long; morphin and bromids seemed to increase the severity of the convulsions. Within twelve hours after receiving ¾ grain of morphin he had 137 convulsions. The greatest number in any twenty-four hours was 481; in the last twelve hours of life he had 331.

New Jersey Medical Society Journal, Orange

December, XIII, No. 12

83 Reed's Bacillus of Epilepsy. A. J. Hinkelmann, Galesburg, Ill.—p. 655.
84 Analysis of Schoolroom Lighting. F. L. Godinez, Jersey City.—p. 656.
85 Services Which Women May Render State in Time of War. E. Marvel, Atlantic City.—p. 661.

New York Medical Journal

December 2, CIV, No. 23

86 Psoriasis as Hysterical Conversion Symbolization. S. E. Jelliffe and E. Evans, New York.—p. 1077.
87 Focal Mouth Infections, Their Systemic Effects and Treatment. R. H. Babcock, Chicago.—p. 1084.
88 Traditional Fallacies About Tuberculosis. M. Fishberg, New York.—p. 1085.
89 Columnar Amniotic Epithelium. H. K. Thoms, New Haven, Conn.—p. 1090.
90 Oxygenated Milk. C. G. Grulee, Chicago.—p. 1092.
91 Ozena. H. Horn and E. A. Victors, San Francisco.—p. 1094.
92 Malingering. P. E. Bowers, Michigan City, Ind.—p. 1096.
93 Syphilitic and Parasyphilitic Affections of Urinary Bladder. A. Strachstein, New York.—p. 1098.
94 Epidemic Gastro-Enteritis, Infantile Paralysis and Influenza. B. Frankel, New York.—p. 1100.

Oklahoma State Medical Association Journal, Muskogee

December, IX, No. 12

95 Suppurative Otitis Media. L. A. Newton, Oklahoma City.—p. 387.
96 Mastoid; Report of Cases. A. W. Roth, Tulsa.—p. 391.
97 Chronic Catarrhal Deafness. C. M. Fullenwider, Muskogee.—p. 394.
98 Catarrhal Deafness; Treatment. W. E. Dixon, Oklahoma City.—p. 399.
99 Mouth and Throat Infections; Their Relation to Diseases of Body. W. H. Livermore, Chickasha.—p. 406.

Public Health Journal, Toronto

November, VII, No. 11

100 Defective Immigrant. C. K. Clarke, Toronto.—p. 462.
101 Importance of Housing and Lodging-House Inspection. J. S. Scholes, Toronto.—p. 470.
102 Sanitation as It Was. A. P. Reid, Middleton.—p. 481.
103 Small Water Works and Sewage Works. R. O. Wynne-Roberts, Toronto.—p. 489.

South Carolina Medical Association Journal, Greenville

November, XII, No. 11

104 Chronic Specific Urethritis; Its Danger and Treatment. E. C. Baynard, Charleston.—p. 339.
105 Physician in Relation to Penal and Charity Problems. A. S. Johnstone, Charleston.—p. 342.

Surgery, Gynecology and Obstetrics, Chicago

December, XXIII, No. 6

106 *Gunshot Wounds of Peripheral Nerves. B. Stookey, Los Angeles.—p. 639.
107 Diagnosis and Management of Acute Extrapelvic Conditions During Pregnancy. E. W. Andrews, Chicago.—p. 657.
108 Diagnosis and Management of Pregnancy in Presence of Acute Abdominal Conditions. J. B. De Lee, Chicago.—p. 660.
109 Diagnosis and Management of Pelvic Affections Complicating Pregnancy. H. F. Lewis, Chicago.—p. 663.
110 *Study of Menopause with Special Reference to Its Vasomotor Disturbances. C. Culbertson, Chicago.—p. 667.
111 Obstructive Calculus Prostate; Report of Cases. W. W. Townsend, Rutland, Vt.—p. 685.
112 Large Solitary and Multiple Cysts of Kidney; Report of Cases. J. H. Cunningham, Jr., Boston.—p. 688.
113 Clinical Data of Polycystic Kidney. W. F. Braasch, Rochester, Minn.—p. 697.
114 *Exstrophy of Bladder; Report of Case Five Years After Implantation of Ureters into Rectum. A. R. Stevens, New York.—p. 702.
115 Cystography. H. L. Kretschmer, Chicago.—p. 709.
116 Calcified Glands Proximal to Common Bile Duct; Cysticoduodenal Ligament; Report of Case. R. S. Fowler, Brooklyn.—p. 718.
117 *Is Employment of Actual Cautery in Treatment of Chronic Ulcer of Stomach Safe Procedure? C. L. Scudder and S. C. Harvey, Boston.—p. 719.
118 Technic for Suprapubic Prostatectomy Under Local Anesthesia. B. S. Barringer, New York.—p. 725.
119 Abdominal Operation for Cure of Cystocele. F. G. DuBose, Selma, Ala.—p. 727.
120 Management of Advanced Cases of Tuberculosis of Hip. C. S. Venable, San Antonio, Texas.—p. 729.
121 Pubiotomy in Impacted Face Presentations. P. Titus, Pittsburgh.—p. 733.
122 Surgical Treatment of Acute Epididymitis. C. M. McKenna, Chicago.—p. 738.
123 Wire Gauze Brain Drain. H. P. Mosher, Boston.—p. 740.
124 A-B-C Rule in Forceps and Version. S. E. Moore, Minneapolis.—p. 741.
125 New Tractor for Perineal Prostatectomy and New Perineal Drainage Tube. G. F. Lydston, Chicago.—p. 742.
126 Technic of External Urethrotomy. J. Niemack, Charles City, Iowa.—p. 743.

106. **Gunshot Wounds of Peripheral Nerves.**—This paper is based on a study of seventy-eight cases of nerve injuries. The number of nerve injuries in the upper extremity (66) greatly exceeds those in the lower extremity (12); of those in the upper extremity the musculospiral was involved in 36 per cent., median in 17 per cent. and ulnar in 41 per cent. Fracture, either complete or incomplete, of the humerus, occurred in 50 per cent. of the musculospiral injuries. In those of the lower extremity, the internal popliteal was not injured, the external popliteal in four cases. The sciatic was completely involved, though never completely severed in any case, incompletely in eight cases, and in each instance the portion forming the external popliteal was the part involved. The details in diagnosis are discussed in full by Stookey.

110. **Study of Menopause.**—From a study of twenty-nine cases Culbertson concludes that the menopause is a functional derangement on the part of various glands of the endocrin system subsequent to the cessation of the ovarian secretion. On this basis may be explained the psychic and somatic manifestations of the menopause. The vasomotor disturbances represent an instability of arterial tension. (*a*) In the majority of cases this takes the form of a vacillating hypertension, both systolic and diastolic. (*b*) The diastolic pressure is not elevated proportionately to the systolic. This produces an increased pulse pressure. (*c*) Hot flushes, sweating and other vasomotor symptoms are directly created by the vacillations in arterial tension. (*d*) In a minority of cases there is arterial hypotension and here also the systolic and diastolic pressures are out of proportion. Hypertension is apparently due to a relative oversufficiency on the part of the hypophysis or the suprarenals. The psychic symptoms are apparently influenced by thyroid dysfunction; in the majority of cases a hyperthyroidism, in the minority, a hypothyroidism. The administration of the missing hormone, represented by the extract of corpora lutea from animals in early gestation, brings about a gradual restoration to normal of the blood pressure with disappearance of the mental symptoms.

This reduction of blood pressure by organotherapy, together with the disproportionate systolic and diastolic rise, is offered as evidence that the hypertension is a functional one and not due to organic changes. Blood pressure estimation is essential, as a means both of measuring the degree of menopause disturbance and of controlling its therapy. An occasional pressure reading is of little or no value. Tension must be determined at frequent intervals, preferably daily until improvement is well under way. The significance of functional hypertension as a factor in uterine hemorrhage is obvious and will be made the subject of a subsequent report.

114. **Exstrophy of Bladder.**—In April, 1911, Stevens operated on a boy, aged 16, under gas and ether anesthesia. Catheters were placed in both ureters. A rosette of bladder wall, including the muscle, was dissected free about each ureteral orifice. The ureters were freed high enough so that they could assume the straightest course from the brim of the pelvis to the rectum. A curved artery forceps was introduced in the rectum. On the tip of this, a small opening was made in the left anterolateral rectal wall, 2 or 3 cm. above the internal sphincter. The forceps were made to protrude, to grasp the edge of the bladder wall about the left ureteral orifice after the catheters had been removed, and to withdraw the ureter well into the rectal lumen. Similarly, the right ureter was placed in the rectum. No suture was taken in the rectal wall. What would come away easily of the bladder wall was removed. A tube was kept in the rectum the first four days after operation, and the rectum irrigated several times a day. The patient now voids urine, often quite free from feces, every three to five hours and sometimes goes seven hours. He gets up at night once or not at all. By measure, a single voiding is often over 350 c.c. The bowels move usually twice a day, and the patient can often distinguish in anticipation between a passage of urine and one largely feces. Occasionally a laxative is needed. Papillae nearly 1 cm. high are formed by the ureteral projections in the rectal lumen and can be readily palpated 2 to 3 cm. above the internal sphincter ani. The patient is at work and is in perfect health.

117. **Cautery in Treatment of Stomach Ulcers.**—On the basis of some experimental work, the authors favor this method of procedure. It appears that the suture of the cauterized margins of the stomach wall is attended by practically a normal reparative process similar to the reparative process following a simple incision with the knife. This having been demonstrated by the actual study of the areas involved serves to show that the method is a safe one for ordinary use in the human. The method is applicable to a chronic ulcer seated on the lesser curvature so far away from the pylorus as to make its easy removal by excision difficult. Ulcers seated on the posterior wall of the stomach which are safely approached by a gastrotomy incision, may have their edges thoroughly cauterized and also the base thoroughly cauterized even when it is adherent to the pancreas, and be sutured with the assurance to the surgeon that the reparative process will proceed satisfactorily. Certain chronic ulcers adherent to the posterior parietes and pancreas do not lend themselves to easy and safe excision and suture. The cautery is sometimes applicable to this special group of cases. The cautery will destroy any beginning cancer in the edges of the ulcer if the cauterization is thoroughly done. The employment of the cautery saves considerable time over the simple excision method.

West Virginia Medical Journal, Huntington

December, XI, No. 6

127 Treatment of Bladder Tumors. J. T. Geraghty, Wheeling.—p. 193.
128 Acute Abdominal Pain; Its Diagnosis and Treatment. R. B. Miller, Parkersburg.—p. 199.
129 Use and Abuse of Exercise in Treatment of Pulmonary Tuberculosis. E. E. Clovis, Terra Alta.—p. 203.
130 Clinical Notes from Congress of Surgeons. J. E. Cannaday, Charleston.—p. 205.
131 Value of Kidney Functional Tests. R. M. Bobbitt, Huntington.—p. 209.
132 Commercialization of Pupil Nurse. E. W. Bauer, Huntington.—p. 211.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

November 18, II, No. 2916

1 *Disinfection of Meningococcus Carriers. M. H. Gordon and M. Flack.—p. 673.
2 *Cultural Requirements of Meningococcus. M. H. Gordon, T. G. M. Hine and M. Flack.—p. 678.
3 Epidemic Cerebrospinal Meningitis. W. J. Denehy.—p. 684.
4 *Serum Treatment of Cerebrospinal Fever. C. Worster-Drought.—p. 689.

November 25, No. 2917

5 *Excision of Knee Joint as Method of Treatment for Severe Infections. A. Fullerton.—p. 709.
6 Gunshot Injuries to Knee Joint. W. Edmond and W. W. Galbraith.—p. 715.
7 *Use of Atropin as Aid to Diagnosis of Typhoid and Paratyphoid A and B Infections. H. F. Marris.—p. 715.
8 Whirlpool Bath. F. P. Nunneley.—p. 721.
9 Relief Staining for Bacteria and Spirochetes. T. H. C. Benians.—p. 722.

1. **Disinfection of Meningococcus Carriers.**—Clinical observations lead Gordon and Flack to believe that, in the case of carriers of the meningococcus, prognosis with regard to the duration of their future period of carrying varies largely with the degree to which their nasopharyngeal secretion is infected by the meningococcus. In the authors' experience the majority of carriers whose nasopharynx yields only a few colonies of the meningococcus clear up quickly. In the case of these persons good results follow local treatment either by direct application of a 1 per cent. solution of chloramine (sodium paratoluene sulphochloramid), or by subjecting them to inhalation of a steam spray charged with zinc sulphate. On the other hand, carriers whose nasopharyngeal secretion yields a copious growth, or a practically pure culture of the meningococcus, are often far more difficult to cure. The results on these persons with zinc salts were disappointing, but they served to emphasize the success of those obtained with chloramine, which, though still somewhat few in number, are more than encouraging, and would appear to indicate that a large proportion of these chronic carriers can be definitely freed of the meningococcus by this form of treatment in a comparatively short space of time. Several cases of chronic nasal or postnasal catarrh were submitted to disinfectant treatment by the automatic steam spray. Improvement resulted and the suggestion is offered that this method is worthy of trial on a larger scale for the treatment of such cases.

2. **Cultural Requirements of Meningococcus.**—The following medium is used by the authors to cultivate the meningococcus: Agar 2.5 per cent. dissolved in the trypsinized broth of Douglas. To this, when it has reached the final stage, is added 5 per cent. of a sterilized extract of peaflour prepared as follows: Peaflour 10 gm., salt 10 gm., distilled water 100 c.c. Steam for twenty minutes and filter. Sterilize the filtrate by steaming on two successive days. This medium (trypsin broth, pea agar or "trypagar") is made neutral to phenolphthalein. Over 200 meningococci originally isolated from the cerebrospinal fluids of patients with meningitis have been subcultured on to trypagar, with the result that they have all been found to grow readily on it; moreover, plates of this medium have been in continual use for growing meningococci in bulk for the purpose of making standard suspensions for agglutination work. The addition of 2 per cent. of serum, or better, ascites fluid, seems to increase the size of the meningococcus colonies and sometimes their vitality.

4. **Serum Treatment of Cerebrospinal Fever.**—The serum used by Worster-Drought was a polyvalent serum, prepared from various strains isolated from a 1915 epidemic. The summary of the treatment adopted is as follows: Serum is given at the earliest possible moment, without waiting for the bacteriologic report. The initial dose is 30 c.c. This amount is repeated daily until the clinical improvement is quite definite and undeniable. The minimum period for continuance of serum is four days, thus covering the merely apparent improvement so often seen on the second or third day. The dose is always 30 c.c., excepting when less than this amount of cerebrospinal fluid can be obtained; in such a case the

fluid withdrawn should exceed the amount of serum injected by at least 5 c.c. When the clinical improvement is quite decided, serum may be omitted; lumbar puncture is then performed daily until the fluid is clear to the naked eye. Should there be any sign of the reappearance of symptoms, particularly mental relapse or increased turbidity of fluid, serum administration is recommenced and continued on the same lines. The amount of fluid withdrawn is always practically the maximum that can be obtained, that is, until it flows through the needle at about the rate of one drop in five seconds. The serum is much better run in by the gravitation method than injected by means of a syringe. When the injection is completed the foot of the bed is raised on blocks for an hour to facilitate the upward flow of the serum. If any subsequent pain is complained of in the back or legs, 10 to 15 grains of acetyl-salicylic acid usually gives relief. The number of cases treated in the manner above described was 16; of these, 11 recovered (68.75 per cent.) and 5 died (31.25 per cent.). The total amount of serum given varied from 110 c.c. to 600 c.c. The prognosis is better the earlier treatment is commenced.

5. **Excision of Knee Joint for Severe Infections.**—Excision of septic wounds into the joint and removal of foreign bodies, if present, followed by complete suture of the synovial membrane, is now the almost universal practice among British surgeons in France. The results of drainage of the joint by tubes, as used in earlier days, were disastrous. Fullerton's experience has been that quite a fair proportion of distended knee joints containing actual pus, from which micro-organisms may be grown, settle down and recover movement after aspiration, aspiration and irrigation, or aspiration followed by the injection of such substances as glycerin and liquor formaldehydi (a few cubic centimeters of a 2 per cent. dilution at least 48 hours old), or ether. In a certain proportion of cases, however, this line of treatment fails. The joint fills up again and again with pus, the cells of which perhaps show diminishing instead of increasing phagocytosis. Pain in the joint increases, the temperature rises, the pulse increases in frequency, and the general condition of the patient becomes such that it is obvious that something radical must be done to save his life if not his limb. The introduction of drainage tubes favors the entrance of microbes other than the original offenders, and a mixed infection is only too certain to result. For the past six months Fullerton has been advocating excision of the bones with wide separation of the ends as a method of dealing with certain knee joints in which conservative methods have failed. This procedure is carried out for the purpose of drainage, even if the bone ends have not been injured.

7. **Atropin as Aid to Diagnosis of Typhoid Infections.**—In practically all cases of the typhoid group during some period of the infection, Marris says, the rate of the heart cannot be increased by atropin as the rate can be accelerated in normal people and those suffering from other diseases. He uses this reaction as a means of diagnosis. At least one hour after a meal should elapse. The patient should lie horizontally and be instructed to keep perfectly quiet throughout. The pulse rate is then taken and recorded minute by minute until found to be steady. Usually ten minutes will be found to suffice for this; then $\frac{1}{33}$ grain atropin sulphate is injected hypodermically, preferably in the triceps region, to insure rapid absorption. The patient now remains absolutely quiet, and, after an interval of twenty-five minutes, the pulse rate is again taken and recorded minute by minute until it is obvious that any rise which may have followed the injection of atropin has passed, and that the rate is falling to a lower level—fifteen to twenty minutes may be necessary. As an arbitrary rule, an increase of the pulse rate by about 20 or more beats a minute after atropin may be accepted as an indication that the patient is probably not suffering from typhoid or one of the paratyphoid series. Should the pulse rate increase only 10 beats or less the reaction is suggestive of an infection by one of these diseases. Readings which give a difference of more than 10 and less than 20 beats a minute are uncertain in their interpretation, and necessitate further observations a day or so later.

Edinburgh Medical Journal

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10 Universities and New Era. A. Ewing.—p. 293.
11 Acetonuria, Acetonemia and Acid Intoxication in Children. J. Thomson.—p. 298.
12 Histology of Disseminated Sclerosis. J. W. Dawson.—p. 311.

Glasgow Medical Journal

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13 Some Eye Symptoms and Their Interpretation. A. J. Ballantyne.—p. 257.
14 Aneurysm of Hepatic Artery—Rupture of Liver—Periarteritis Nodosa. J. H. Teacher and W. R. Jack.—p. 277.
15 Cessation of Vertiginous Attacks Following Intranasal Treatment. R. Fullerton.—p. 286.

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16 Future of Crippled Sailor and Soldier. C. W. Hott.—p. 629.
17 Relation of Enterococcus to Trench Fever and Allied Conditions. T. Houston and J. M. McCloy.—p. 632.
18 Diagnosis of Tuberculosis by Tuberculin. H. A. Ellis.—p. 638.
19 Use of Celluloid in Plastic Surgery. C. Higgens.—p. 643.
20 Case of Chorion Epithelioma. H. N. Taylor.—p. 644.
21 Spinal Anesthesia with Special Reference to Acute Abdomen. P. P. Cole.—p. 645.
22 Case of Beriberi. G. M. Findlay.—p. 646.
23 Three Cases of Belladonna Poisoning. M. E. Joll.—p. 647.

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24 *Natural History of Septic Wounds. K. Goadby.—p. 851.
25 *Value of Vaccine Therapy in Treatment of Septic Gunshot Wounds. R. H. J. Swan.—p. 859.
26 Psychology of Malingering and Functional Neuroses in Peace and War. T. Lumsden.—p. 860.
27 Angle of Dropping Pipet and Accuracy in Agglutination Technic. R. P. Garrow.—p. 863.

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28 *Some of Maladies in which Splenectomy May Be Indicated. W. J. Mayo.—p. 889.
29 Medical Profession and Campaign against Venereal Disease. O. May.—p. 893.
30 Diagnostic Value of Agglutinin Determinations in Inoculated Individuals. E. W. A. Walker.—p. 896.
31 *Pieces of Clothing Embedded in War Wounds. R. J. Willan.—p. 901.
32 *Toxic Action of Dilute Pure Sodium Chlorid Solutions on Meningococcus. C. Shearer.—p. 932.

24. **Natural History of Septic Wounds.**—This is the third section of Goadby's report. It relates mainly to certain tissue reactions against bacterial infection, and may be summarized as follows: The energy dissipated in the tissues from projectiles produces changes in a wider area than that immediately lacerated by the projectile itself. The cellular activity promoting repair in the affected areas proceeds concomitantly with degenerative processes; with the degenerative processes are associated anaerobic bacteria, *B. perfringens*, *B. malignant-edema* and possibly *B. Hibler* IX type. There is direct histologic evidence of tissue digestion, in addition to necrotic changes due to traumatism or coagulation owing to interference with circulation. Evidences of degenerative tissue changes are found in tissue removed from wounds at long period after the original infection of the wound. Acid production by anaerobic bacteria of the perfringens class is an important factor in the determination of clinical gas gangrene. The general blood reaction in the direction of leukocytosis is more related to infection with the pathogenic cocci than the anaerobic bacilli. No drainage in the ordinary sense of the term can easily affect the contorted intricacies of a sinus passing first of all into bony tissue and thereafter radiating in several directions; it is in this type of wound, or rather sequelae to a wound, that the bacteria are found lodged in the tissues, partially shut off from the action of the living cells. Operative interference sets them free; they may, and do, reinfect the surrounding areas, and to raise the patient's resistance to such disability is clearly a therapeutic step of supreme importance.

25. **Vaccine Therapy in Septic Gunshot Wounds.**—To such an extent has Swan modified his former views as to the value of vaccine in these cases, that he now directs that every case with a septic wound should receive an initial dose of a mixed polyvalent vaccine of proteus and streptococcus until the true bacteriology of the individual wound can be worked

out and before any surgical measure, other than freely incising the wound to secure adequate drainage, is adopted. The future course of vaccines depends on the examination revealed in the individual wound, when appropriate combinations are given. The greatest value of vaccine therapy is in the treatment of complicated septic fractures of long bones and of fractures which open into joint cavities. Swan gives a preliminary dose of polyvalent vaccine (proteus and mixed streptococci), and then after two or three days freely opens the wound to secure adequate drainage, approximating the fragments and only removing those fragments which are undoubtedly completely separated, at the same time taking advantage of the opening of the wound to obtain further bacteriologic examination. In the treatment of septic gunshot fractures which involve a large joint, vaccine therapy holds an important place. Another feature is the freedom from secondary hemorrhage in patients treated with a polyvalent proteus and streptococcal vaccine.

28. **Maladies in Which Splenectomy May Be Indicated.**—Mayo believes that splenectomy is a curative measure in properly selected cases of splenic anemia, hemolytic jaundice and allied states, and that it may be curative in certain as yet little understood conditions which are confused with pernicious anemia, leukemia and cirrhosis of the liver. Splenectomy is of value in certain types of parasitic splenomegalia—notably, malaria and syphilis. It is of value for the palliation of some types of pernicious anemia. In portal and biliary cirrhosis associated with splenomegalia, splenectomy may have a field of usefulness, but there has not been sufficient experience with it in these conditions to furnish reliable data. In true leukemia, splenectomy does not appear to have standing, but in connection with the use of radium it is at least to be considered.

31. **Clothing Embedded in War Wounds.**—Willan aimed at trying to find a single substance to treat the "action clothes" which would satisfy the following requirements: (1) would make the garments (or fragments of same) impermeable to Roentgen rays; (2) would have some antiseptic properties; (3) would contain some antiseptic which was nonirritating to the tissues; (4) would contain some antiseptic which was nonirritating to the skin. He soaked strips of flannelette in the following solutions, respectively: potassium permanganate, 1:5,000; hydrargyrum perchloridum, 1:1,000; tincture of benzoin compound; aqueous solution of equal parts of salicylic acid and boric acid; and boric acid, saturated solution. These strips were dried, laid in a row, and roentgenographed. The strip soaked in tincture of benzoin compound showed the densest shadow, while that treated with the salicylic and boric acid was next best in density. As a medium similar to salicylic and boric acid seemed to be the easiest one to work with, Willan decided to experiment with a modification of this. Salicylic acid by itself is not very soluble in water. If, however, borax be added it is readily soluble. The solution he used was: boric acid, 15 grains; salicylic acid, 15 grains; borax, 14 grains; water sufficient to make 1 ounce.

32. **Sodium Chlorid Solutions and Meningococcus.**—In experimenting with a large number of freshly isolated strains of the meningococcus, Shearer noticed that almost all of them were killed when placed for a short time in dilute pure sodium chlorid solutions. The action of sodium chlorid is most toxic to the meningococcus when the concentration of the salt is not below 0.85 per cent. and not much above 0.9 per cent. sodium chlorid. It was found that freshly isolated meningococci were more vulnerable than old laboratory cultures. While laboratory cultures could sometimes resist the action of pure 0.85 per cent. sodium chlorid for three or four hours, freshly isolated strains seldom resisted its action for more than twenty minutes. Shearer has found, as a general rule, from a large number of experiments that one or two drops of an emulsion (of 5,000 million meningococci to the cubic centimeter in distilled water) is the proper quantity of emulsion to be added to 2 c.c. of 0.85 per cent. saline to demonstrate the toxic action of pure sodium chlorid effectively on the meningococcus. The toxic action of a 0.85 per cent. sodium chlorid solution on the meningococcus can be readily antagonized and rendered harmless by the addition of a trace of some bivalent salt such as calcium chlorid with or without the addition of a small quantity of potassium chlorid.

Bulletin de l'Académie de Médecine, Paris

October 31, LXXVI, No. 43, pp. 325-344

33 *Sifting Out the Tuberculous from the Suspects. (Les enseignements cliniques d'un centre de triage de militaires suspects de tuberculose.) E. Sergent and G. Delamare.—p. 329.
34 Bacteriologic Study of Hypochlorites Applied in Sterilization of the Hands. Lochelongue and Dubard.—p. 334.
35 The Bacteria Found in War Wounds. (Recherches sur la flore bactérienne des plaies de guerre.) H. Tissier.—p. 337.
36 Detection of Picric Acid in the Serum with Factitious Jaundice. Castaigne and Desmoulières.—p. 339. See Paris Letter, p. 1771.
37 Experimental Generalized Vaccinal Fever. (De la vaccine généralisée expérimentale. Conditions de sa production.) L. Camus.—p. 342.

33. **Sifting Out the Tuberculous from the Suspects.**—Sergent and Delamare discuss the lessons learned from months of work in a *centre de triage*, to which the soldiers suspected of tuberculosis are referred for the final diagnosis. Among 600 merely suspected of tuberculosis, 89 proved to be exempt from active tuberculosis and tubercle bacilli were found in the sputum of 83. The diagnosis was thus positive in these, but in 428 it proved a difficult matter to determine whether their pulmonary trouble was tuberculous or not, and especially whether it was active or healed. In roentgenoscopy, a veiled aspect of the apex is often found accompanied by enlarged tracheobronchial glands. They found that this indicated a lesion in the parenchyma when there was absolute dulness, exaggerated vibrations, crepitation and blood in the sputum, when the veiled aspect of the apex was not modified by coughing, and when stripes and spots could be detected. On the other hand, the predominance of changes in the pleura was manifest when there was only subdulness, the vocal vibrations physiologic or reduced, and friction sounds were evident, the pupil on that side dilated or smaller than its mate, and the supraclavicular glands enlarged. This syndrome of apical pleuritis is differentiated further by general and functional examination of the patient, his antecedents and the date of the first symptoms. The pleural "veil" shows the apex a little lighter after coughing.

As a final test, they gave 1 gm. potassium iodid daily for five days. A rise in temperature is the rule when the lesion is active, but there is no rise if it is healed solid. They warn that this test should not be applied unless confident of a favorable response, as otherwise it might induce congestion and hemoptysis if there is an active process. They found that exactly 50 per cent. of the suspects referred to their station were free from active tuberculosis. Without this scientific differentiation, many if not all of them would have been classed among the dangerous tuberculous, as one of the unexpected effects of the war is a widespread tuberculophobia.

Paris Médical

November 11, VI, No. 46, pp. 421-436

38 Microscopic Examination of Secretions of Wounds at Different Stages. (L'examen cytologique des plaies de guerre. Sa valeur pratique.) A. Policard.—p. 421.
39 Beneficial Influence of Insufflation of Oxygen in Treatment of Traumatic Pleurisy. (De l'emploi de l'oxygène dans le traitement des pleurésies purulentes consécutives aux plaies du thorax.) Dehau and J. C. Roux.—p. 424.
40 Resection for Subphrenic Abscess from Tuberculous Chondritis. S. Mercadé.—p. 425.
41 Early Passive and Active Mechanotherapy for the Wounded Still in Bed. Amieux.—p. 427.
42 Suturing Stump after Amputations. (Faut-il fermer les moignons d'amputation de guerre?) J. Fiévez.—p. 433.

Presse Médicale, Paris

November 9, XXIV, No. 62, pp. 497-504

43 War Wounds of the Spinal Cord. (Les plaies de la moelle épinière par blessures de guerre.) G. Guillain and J. A. Barré.—p. 497.

November 16, No. 63, pp. 505-512

44 *Experimental Cholera. (La pathogénie du choléra. Reproduction expérimentale de la maladie.) G. Sanarelli.—p. 505.
45 Malignant Anaerobic Infections of War Wounds. G. Lardennois and J. Baumel.—p. 506.

44. **Reproduction of Cholera in Suckling Rabbits.**—Sanarelli found that the stomach always destroyed cholera vibrios

taken by the mouth, but he was able to reproduce the disease at will by injecting vibrios into a vein or subcutaneously. By these routes they get into the blood and thus reach the intestinal walls where they locate by preference. The same effect was realized by injection of the vibrios directly into a loop of the small intestine. He found it impossible to reproduce the disease in the young of mother rabbits that had been vaccinated against cholera. By injecting colon bacilli directly into the wall of the appendix or sacculus rotundus, or injecting into a vein an extract of the toxic products of colon bacilli, this damages the intestinal wall so that cholera vibrios getting into the general circulation locate at once and proliferate here rapidly. He thinks that his data demonstrate that in man all the vibrios do not pass through the stomach directly into the intestine but get into the blood—possibly through the tonsils—and thus reach their favorite site, the wall of the bowel close to and below the ileocecal valve, and settle there.

Progrès Médical, Paris

November 5, XXXI, No. 21, pp. 203-212

46 Effects on Glands and Secretions of Shock from Explosion Nearby. (La répercussion glandulaire et humorale des commotions.) M. Loeper and G. Verpy.—p. 203.
47 Radioscopic Outline Sketches. (Utilisation habituelle des calques radioscopiques en chirurgie de guerre.) A. Binet.—p. 205.
48 Open Treatment after Aseptic Operations. (De la suppression complète du pansement à la suite des opérations aseptiques.) A. Chalier.—p. 207.
49 Causes and Treatment of Dyspepsia in Infants. A. Satre.—p. 208.

Archiv für klinische Chirurgie, Berlin

CVIII, No. 2, pp. 151-305. Last indexed Sept. 2, p. 776

50 The Question of Amputation of the Legs, Supports and Artificial Legs. (Zur Amputations- und Prothesenfrage für die untere Extremität.) R. Hofstätter.—p. 151.
51 *Successful Application of Thiersch Flaps in the Mouth. (Ueber Verpflanzung Thiersch'scher Epidermislappchen in die Mundhöhle.) L. Moszkowicz.—p. 216.
52 *Periosteum Plastics: Substituting the Tibia by means of the Fibula. (Zum Ersatz grosser Tibiadefekte durch die Fibula.) L. Moszkowicz.—p. 221.
53 Pathology and Treatment of Hyperextension in the Elbow. A. Suter.—p. 230.
54 Hygroma and Free Bodies of Bursa in the Knee. (Hygrom und Corpora libera der Bursa semimembranosa.) E. Sonntag.—p. 245.
55 Bone and Dura Plastic Operations on the Skull. (Die freie Knochenplastik zum Ersatz von knöchernen Defekten des Schädels mit und ohne gleichzeitigem Duraersatz.) H. Nieden.—p. 281.

51. **Thiersch Flaps in the Mouth.**—The entire jaw bone had been shattered into fragments by a shrapnel ball, leaving only the ascending rami. The mouth was damaged extensively otherwise and the man had lain on the battlefield for three days. After he was brought in, it seemed impossible to feed him, so he was eight days without food. The wound was then cleared out and he was fed through a stomach tube for seven months. Moszkowicz gives an illustrated description of the various operations required to restore fairly good functional conditions; the outline of the chin is now normal. He lined the wound with Thiersch flaps, implanting them first in a subcutaneous pocket close to the mouth, where they healed in place under aseptic conditions. Then this pocket in the skin was opened into the mouth, the epidermis flaps thus becoming for the first time mouth epidermis. The technic, he remarks, is like that followed in building a bridge without interrupting traffic; the new bridge is built close to the old one, and when it is ready it is built up in the place of the old bridge. This method can be applied at any point where the flaps are destined for a body cavity moistened with secretions. He has in mind, in particular, strictures of the urethra and rectum and plastic operations of all kinds with which the production of an epithelium-covered mucosa is of moment.

52. **Periosteum Plastics.**—Moszkowicz calls attention to the atrophy of what is left of the tibia when the weight-bearing is transferred to the fibula. He gives a roentgenogram illustrating this, taken from a case under observation for several years. It demonstrates beyond question that the fibula cannot be counted on for a reliable support unless its lower end fits squarely on the middle of the head of the talus, instead of being left in its normal one-sided position. He accomplished practically this in a case described in detail. After removal of the upper two thirds of the tibia, for sarcoma, on a boy of 11, he cut a pedunculated flap, 4 cm. long, from the periosteum of the fibula and laid it over the top of the tibia stump, thus covering the open bone-marrow cavity. Callus developed wonderfully from it until the tibia and fibula at this point were solidly bound together by the bone growth. The fibula above this grew to the size of the tibia in the other leg, but below this it retained its former size, testifying that the weight was borne mainly by the adherent tibia stump.

Berliner klinische Wochenschrift

October 25, LIII, No. 43, pp. 1165-1184

56 Percentages of Positive Findings in Bacteriologic Tests for Typhoid in Epidemic. (Die Leistungsfähigkeit der bakt. Typhusdiagnose, gemessen an den Untersuchungsergebnissen bei der Typhusepidemie in Jena 1915). K. E. F. Schmitz.—p. 1165.
57 Typhoid Pneumonia. (Typhus und Pneumonie.) A. Döblin.—p. 1168.
58 *Etiology of Typhus. (Praktische Bemerkungen zur Aetiologie des Fleckfiebers.) E. Fuld.—p. 1170.
59 Potato Flour in Infant Feeding. (Die Verwendung von Kartoffelwalzmehl als Zusatz zur Säuglingsnahrung.) E. Müller.—p. 1172.
60 True Hermaphroditism in Man and Animals. L. Pick. Concluded.—p. 1173.

58. **Etiology of Typhus.**—Fuld replies to recent assertions of E. Friedberger to the effect that the role of the body louse in the transmission of typhus is not absolutely proved. Fuld being convinced that the evidence is all in favor of this to date. One gap in the chain of evidence has recently been closed—development of typhus in persons who have not been close enough to typhus patients to get lice from them—this gap in the evidence has been closed by authentic witnesses of lice being blown by the wind from one person to another. The fact that typhus died out spontaneously in all the prison camps during the heated term, whether they had been "unloused" or not, Fuld shows testifies further in favor of louse transmission, as lice are killed by a temperature of 35 C. (95 F.), according to Anderson, Nicolle and others.

Correspondenz-Blatt für Schweizer Aerzte, Basel

November 4, XLVI, No. 45, pp. 1505-1536

61 *Pathology of the Persisting Omphalo-Enteric Duct. J. Dubs.—p. 1505.
62 Importance of Respiratory Exercises to Overcome Effects of and Counteract Tendency to Curvature of the Spine. (Zur Kenntnis und Behandlung kyphotischer Wirbelsäuleverkrummungen und der sie begleitenden Thoraxsenkung und deren Folgen.) E. Stotzer.—p. 1519.
63 Difficulty of Differentiating Erythema Induratum. (Einige Bemerkungen über einen Fall von Erythema induratum Bazin.) Tièche.—p. 1522.
64 Traumatic Neuroses and Their Treatment. (Psychische Traumata und deren Behandlung.) T. Zangger.—p. 1526.

61. **Pathology of the Persisting Omphalo-Enteric Duct.**—Dubs reports two cases which demonstrate anew the possible dangers from persistence of this fetal duct, and emphasize the necessity for its radical removal when its presence is suspected. Not only the danger of prolapse of intestines through the fistula opening into the duct, but the manifold dangers which may result from the transformation of the duct into a Meckel diverticulum, justify its prompt removal. He reviews the literature on the persisting vitelline duct and also on volvulus and other mishaps to which one is exposed from a Meckel's diverticulum. In the first of his two cases there was prolapse of the bowel through a congenital vitelline duct cyst. The prolapse occurred because the attending physician did not recognize the prolapsed mucosa of the duct for what it was. He took it for a granuloma, and tried to remove it by ligating the pedicle, thus bringing on the prolapse in the babe. A similar mishap from the same cause is recorded in the literature by two others. In the second case there was a subcutaneous cyst formed by the duct. He describes and gives some diagrams showing the various forms which may be assumed by the persisting omphalo-enteric duct. His bibliography fills two closely printed pages.

He declares that the diagnosis of the persisting duct is simple and easy if the physician will examine with the catheter

every umbilicus that does not heal up promptly. The small tumor formed by the partial prolapse of the mucosa of the duct always has a small opening through which the catheter can be passed into the interior of the abdomen. This is never observed with teratomas or granulomas, there being no orifice in or around the tumor through which the catheter can be passed in deep. The emergence of fecal matters or flatus is an aid in differentiation, as otherwise a persisting urachus might be suspected. In case of doubt, any protuberance at the umbilicus with a minute opening at any point should call for radical operative removal of the entire persisting omphalo-enteric duct. No half-way measures should be considered. The duct should be cut off close to the bowel. If there is extensive prolapse of intestines, as in one of the personal cases described, the abdominal cavity should be opened and the umbilicus reached from behind.

Deutsche medizinische Wochenschrift, Berlin

October 19, XLII, No. 42, pp. 1277-1308

65 *Elastic Traction on Nerve Stumps to Close Up Gap. (Zwei neue Methoden der Ueberbrückung grösserer Nervenlücken.) A. Bethe.—p. 1277.

66 *Sources of Error in Testing for Agglutination. (Ueber Fehlerquellen der Gruber-Widalschen Reaktion.) H. Conradi and R. Bieling.—p. 1280.

67 *Etiology of Weil's Disease. IV. H. Reiter.—p. 1282.

68 *Treatment of Epidemic Meningitis. (Zur Klinik und Therapie der Weichselbaumschen Meningokokkenmeningitis.) O. Götz and F. Hanfland.—p. 1284.

69 Operative Mobilization of Joints. (Zur operativen Gelenkmobilisation.) W. Röpke.—p. 1287.

70 Treatment of Amputation Stumps. (Behandlung der Amputationsstumpfe der Invaliden.) B. Dollinger.—p. 1289.

71 To Arrange Trucks for Carrying Wounded. (Ergebnisse der Beförderung Verwundeter auf Lastkraftwagen.) Flemming. —p. 1292.

72 Is There Danger of Undernourishment for the Tuberculous Under Present Conditions? (Ist eine Unterernährung der Tuberculosen augenblicklich zu befürchten?) W. Lublinski.—1293.

65. **Stretching the Stumps of a Nerve to Bridge a Gap.**—Bethe gives an illustrated description of work on dogs undertaken to see if it might not be possible to draw the stumps of a nerve together by gentle, long continued traction with rubber bands. His attempts were entirely successful. The animals played in their cage and ate with good appetite while wearing the elastic bands, and gaps in the sciatic nerve of from 3.6 to 5.8 cm. were thus closed up in six dogs. This is equivalent to a gap of 11 or 16 cm. in man. The method has also been applied in five clinical cases. The stretching was borne without special pain, and the healing proceeded smoothly in four of the cases; in the fifth, ascending neuritis developed. In the experiments on dogs, regeneration and restoration of function seemed to proceed as regularly in the stretched nerve as in the unstretched sciatic on the other side, conditions otherwise being the same. Function returned on both sides equally promptly. Nerves seem to stand traction without injury, comparatively speaking, when applied evenly and not too suddenly.

66. **Sources of Error in Estimating Diagnostic Agglutination.**—A number of authors have called attention to the rise in the agglutination titer when a person who has been vaccinated against typhoid acquires typhoid later. They regard this gradual rise as a sign that the intercurrent disease is surely typhoid. But Conradi and Bieling report some clinical cases with this gradual rise in the agglutinating property but which necropsy revealed to be pure tuberculous meningitis or other disease, without any signs of recent typhoid. To study the matter further they experimented with rabbits, the results of their experimental research and clinical findings all demonstrating that any intercurrent infection is liable to increase the agglutination titer in a person who has ever had typhoid or been vaccinated against it. The new process of elaboration of antigens started by the intercurrent infection revives the old process of production of antibodies which had settled down into quiet, reactivating it anew. And this occurs from a nonspecific bacterial stimulus. This increase in the nonspecific agglutinins under the influence of a fresh infection runs up rapidly but soon drops again after reaching its highest point. They warn in conclusion, "This increase in the agglutination titer cannot be accepted in the differentiation of typhoid in those who have been vaccinated against typhoid or who have ever had typhoid; it is merely an anamnestic seroreaction."

67. **Infectious Jaundice.**—Reiter relates further points in the biology of the *Spirochaeta nodosa*, the micro-organism which answers to the tests for the causal germ of infectious jaundice. He relates further that an active vaccine can be made with it which will protect against Weil's disease. The question now is to determine the intermediate host, and he urges in all cases of infectious jaundice to make a special study of possible hosts in the environment.

68. **Treatment of Epidemic Meningitis.**—Götz and Hanfland report their experiences with meningococcus meningitis in forty-five soldiers and sixteen civilians in the Tübingen region. Contagion by direct contact was known only in two of the total sixty-one cases. There was an exanthem in four cases. The routine treatment was by repeated lumbar puncture, the patient lying on his side, following with an injection of the antiserum. When the spinal fluid was full of pus, they injected after the lumbar puncture from 30 to 70 c.c. of warm saline, to rinse out the cavity, letting it slowly run in and slowly run out again. They repeated this two or three times in some cases; when the pressure in the spinal fluid was once more 100 mm. they then injected the antiserum. The mortality in the sixty-one cases was 24.59 per cent., but omitting five moribund cases it was only 17.8 per cent. In two cases they punctured the corpus callosum to get the antiserum into the ventricle, and the results were excellent in both. A number of the patients displayed a tendency to tachycardia for a long time although nothing organically wrong could be found in the heart. The tachycardia testified that the vagus was feeling the toxic influence of the disease, and hence suggested that the meninges were still suffering likewise, so that the serotherapy should not be dropped too soon. They finally learned from some disastrous experiences not to discharge the meningitis patient as cured until under prolonged surveillance the pulse, temperature, general condition, pressure in the lumbar fluid, and the cell count all showed normal conditions. In three of the entire number the tendency to tachycardia or high pressure persisted interminably, and these men were given long leave of absence on the assumption that some chronic meningeal irritation had been left by the infection.

Medizinische Klinik, Berlin

October 15, XII, No. 42, pp. 1091-1116

73 Accidental Heart Murmurs. (Ueber akzidentelle Geräusche am Herzen.) R. Fleckseder.—p. 1091.

74 Tetanus in the First Year of the War. H. Pribram.—p. 1094.

75 *Diagnosis of Stomach Affections without the Stomach Tube. (Magendiagnostik ohne Schlundröhre.) R. Landerer.—p. 1098.

76 Morbid Self-Accusation of Malingering; Two Cases. (Krankhafte Selbstbezichtigung der Simulation.) Serog.—p. 1100.

77 Roentgen Localization of Foreign Bodies. (Zur röntgenoskopischen Fremdkörperlokalisation.) F. Vogel.—p. 1103.

78 Polarization Microscope in Differentiation of Kidney Diseases. (Untersuchung des Urinsediments mit dem Polarisationsmikroskop mit Differentialdiagnose der verschiedenartigen Nierenerkrankungen.) F. Munk.—p. 1104.

75. **Diagnosis of Stomach Affections Without the Stomach Tube.**—Landerer quotes Boas' list of sixteen conditions in which the use of the stomach tube is contraindicated, but he does not agree with him that gastric neuroses are always a contraindication. It may be of prime importance to convince the patient by the stomach-tube findings that he has no organic gastric trouble. The specialist can tell at a glance that the neurasthenia is the primary trouble, but the general practitioner can affirm this only by exclusion. Roentgen examination reveals motor disturbances, and there are no contraindications for this. Aside from these methods of examination, much can be learned from inspection of the vomit, although it usually has stood for some time before it is inspected. If the reaction is alkaline or neutral, we cannot tell whether this is due to admixture of saliva, etc. But if it is acid, and the acid proves to be hydrochloric acid, then we know that this must have come from the stomach. If present in excessive amounts, hyperacidity is beyond question. The presence of lactic acid is not so conclusive in vomit as in the siphoned-out stomach content. Determination in

vomit of the digestion of starch is of little use as the saliva may have cooperated; admixture of blood is also unreliable. If rennin and pepsin are found, the findings are conclusive, but if they are not found, it is impossible to say whether they might not have been inactivated or destroyed by fermentation, etc.

All the findings in vomit are merely of presumptive import; similar findings in fresh siphoned-out stomach content are conclusive. When it is impossible to use the stomach tube, we must put the patient on a test diet and examine the stools. This is tedious as he has to stay in bed for three days and get only the unappetizing test diet. As the stomach gets upset ten times at least to the pancreas' once, the finding of undigested muscle fibers and of fat points usually to the stomach. Occult blood should always be sought if there is the least suspicion of ulcer or cancer. In case of dubious findings, Landerer exclaims, "Which is worse for the patient, to take a course of treatment for a suspected but really nonexistent ulcer or to have ulceration overlooked?" It is important further to estimate the effect of treatment of an ulcer by examining the stools for blood. No patient should be discharged as cured until this has given negative findings several times.

When a patient has good appetite and good gastric digestion but a tendency to diarrhea, this suggests a deficit of hydrochloric acid in the stomach. By giving a little hydrochloric acid in water, after a meal, it usually passes at once into the small intestine, but from there it may excite the normal reflex closure of the pylorus, and thus enable the food to be kept longer in the stomach and be better digested than would be the case without the therapeutic acid. This may explain the improvement under fat in some cases of adylia; the fat checks motor functioning and the food is kept longer in the stomach. Pain in the stomach that subsides when something is eaten is regarded as a sign of hyperacidity, but this is more certain when the pain can be checked by giving an alkali.

Münchener medizinische Wochenschrift, Munich

October 10, LXIII, No. 41, pp. 1445-1476

79 *Roentgen Treatment of Mammary Cancer; Single Exposure. (Die Strahlenbehandlung des Brustkrebses in einer einmaligen Sitzung. Festlegung der Karzinomdosis.) W. Friedrich and B. Krönig.—p. 1445.

80 Advantages of Duodenal Sound in Roentgen Examination after Gastro-Enterostomy. (Aufgaben und Schwierigkeiten der Röntgenuntersuchung Gastroenterostomierter. Lösung durch Verwendung der Duodenalsonde.) J. Freud.—p. 1447.

81 Retarded Pulse. (Ueber Pulsverspätung.) J. Neumayer.—p. 1449.

82 *Nasal Diphtheria. K. Ochsenius.—p. 1450.

83 *Perforation of Cholecystitis into Abdominal Wall. (Ueber extraperitoneale Perforation der Gallenblase.) C. Hörhammer.—p. 1451.

84 By-Effects with Intramuscular Injections of Menthol-Eucalyptol in Treatment of Pulmonary Tuberculosis. C. Pöhlmann.— p. 1452.

85 Beneficial Results from Vaccination against Typhoid. (Wert der Typhusschutzimpfung.) K. Walko.—p. 1461.

86 War Wounds of the Larynx. (Ueber Kriegsverletzungen des Kehlkopfs nach Erfahrungen dieses Krieges.) E. Allenbach. —p. 1464.

87 *Treatment of War Aphonia. (Weitere Heilungen von Stimmverlust im Krieg.) O. Muck.—p. 1466.

88 Empyema and Abscess after Wounds of the Lungs. (Zur Entstehung und Verhütung von Lungenabszessen und -empyemen nach Lungenschüssen.) M. Hirsch.—p. 1468.

89 Prophylaxis and Treatment of Gas Phlegmons. W. Rübsamen.—p. 1468.

90 Advantages of Transplanting Skin in Treatment of War Wounds. (Mehr Transplantieren!) Holzapfel.—p. 1469.

91 Improvised Rat Traps. (Rattenbekämpfung an der Front während des Stellungskrieges.) Kessler.—p. 1470.

92 Open Metal Trelliswork to Protect Wounds. (Wundgitter zur offenen Wundbehandlung.) C. Hamburger.—p. 1471.

93 Improved Principles for Artificial Legs. (Verbesserte Beinprothesen.) v. Burk.—p. 1472.

94 Device for Extension Treatment of Fractured Femur. (Extensionsapparat zur Behandlung von Oberschenkeldurchschussfrakturen.) M. Koralek.—p. 1473.

95 Substitute for Adhesive Plaster Extension Dressing. (Ersatz des Heftpflasterstreckverbandes.) O. Müller.—p. 1473.

96 Folding Litter-Chair. (Neue Verwundeten—Kranken—Trage.) Witzenhausen.—p. 1474.

97 Glycol as Substitute for Glycerin. (Neuer brauchbarer Glyzerinersatz.) C. Bachem.—p. 1475.

79. Dosage for Roentgen Treatment of Cancer at Single Sitting.—This communication from the Freiburg gynecologic clinic relates experiences which have led to the adoption of a special dose for hemorrhagic uterine affections, for cancer of the breast, etc. The iontoquantimeter findings are the gage. It is emphasized that for myoma and hemorrhagic uterine affections and for mammary cancer this method of treatment by a single dose should be preferred to all others.

82. **Nasal Diphtheria.**—Ochsenius has encountered in his private practice at Chemnitz during the last nine months thirty-two cases of pure nasal diphtheria. The majority were between 2 and 6 years old. In 88 per cent. he found that one side of the nose was alone affected at first. A tendency to repeated but slight hemorrhages from the nasal mucosa was evident in every case. This should always call for bacteriologic examination of the nasal secretion. The nose is obstructed with brownish scabs; a purely suppurative discharge is rare; in some of the cases there was moderate secretion with excoriations and scabs. Formed membranes were only very rarely expelled. The course was always favorable. Unless complications developed, the general health was but slightly impaired; the younger children alone were pale and languid. There were no appreciable complications except otitis media in two sisters. One child of 4 had likewise a diphtheric vulvitis, both healing within a week under antitoxin. He applied locally glycerin ointment or cinnabar salve. The longest period of positive findings in the secretions was eight weeks. Usually the bacilli disappeared quite early. The insignificant symptoms at first led to contagion of others, as the diphtheria was not suspected until the mischief was done. Two of the children developed diphtheria in the other side of the nose after an interval of five and ten weeks and a third child, three weeks later, developed typical diphtheria in the throat. One child of 3 presented severe symptoms of anaphylaxis for five days after injection of 1,500 units of horse antitoxin, thirty-six days after 500 units of beef antitoxin had been injected as a preventive.

83. **Extraperitoneal Perforation of the Gallbladder.**—The woman of 38 had complained for six years of occasional pains and vague discomfort on the right side and at the costal arch, but there was no jaundice and the pains did not spread. For the last six months the right side had been swelling until a tumor protruded from the costal arch nearly to Poupart's ligament, and an incision in the posterior sheath of the rectus revealed that cholecystitis had perforated into the abdominal wall, with escape of numerous gallstones. The contents were slightly purulent but not fetid. The large abscess was cleared out and then closed. The incision was then enlarged and the gallbladder removed, leaving a portion adherent to the intestines, first drawing it up with two rows of sutures and burying it in the peritoneum. The abscess cavity was then reopened, curetted and tamponed with iodoform gauze. Smooth recovery, with only a slight rise in temperature during the first few days. It is the only case of the kind known at the clinic (Leipzig) in ten years among 584 bile-apparatus cases. Hörhammer reviews the scanty literature on the subject, adding that the gallbladder contents have been known to slip down into the groin or thigh in such cases.

87. **Treatment of Functional Aphonia.**—Muck reports numerous cases in which the voice lost from a fright was restored again by a fright. For the latter he lowers a ball into the larynx. The scream of fright as the man feels he is suffocating, starts the voice reflex anew, and the aphonia is conquered at a single sitting. He has now a record of twenty-seven such cases.

Therapeutische Monatshefte, Berlin

October, XXX, No. 10, pp. 465-512

98 *Modern Treatment of Syphilis. (Die moderne Salvarsan-Syphilistherapie der Autoren.) O. Naegeli.—p. 465. Concluded.

99 Substitute for Cod Liver Oil. Riehn.—p. 476. Concluded.

100 Yeast in Infant Feeding. (Zur praktischen Verwendbarkeit der Hefe im frühesten Kindesalter.) Riehn.—p. 476. Concluded.

101 *Indications for and against Curetting the Uterus. (Die Ausschabung der Gebärmutter.) D. Pulvermacher.—p. 483.

102 Comparative Physiologic Tests of Digitalis Preparations. J. W. Hamner (Stockholm).—p. 484.

98. **Modern Treatment of Syphilis.**—The first instalment of Naegeli's article was reviewed in these columns, October 28, p. 1330. He here recapitulates his views and gives eight pages of bibliography, with titles in full, saying that the technic of salvarsan treatment was worked out in 1913, and the years since have brought no further material progress in it. He advocates beginning with small initial doses and continuing with moderate dosage. The total should be quite considerable at the first course, and the interval between courses or sporadic treatments should not be over two or three months, to ward off neurorecurrence. By combining salvarsan with mercury and eventually with iodid, the curative effect is enhanced without increasing the dangers, and the length of the treatment is shortened. He adds that salvarsan renders preeminent service in syphilis in pregnant women and in small children, and with syphilitic changes in the central nervous system.

101. **Indications for Curetting the Uterus.**—Pulvermacher never curets except to remove retained scraps after an abortion or proliferating decidua or to obtain scraps for microscopic examination with suspicion of cancer. He warns that under all conditions general anesthesia is required for it, and that when the mucosa lies directly on the muscle, without any submucosa, as in case of proliferation of decidua, great caution is necessary to avoid injuring the muscle. Hemorrhage recurring repeatedly at brief intervals is characteristic of this. If the muscle is injured during the curetting, the hemorrhages soon return. In such a case the uterus does not look much abnormal, but it bleeds at the slightest touch. The tubes and ovaries seem normal but the women show signs of intense anemia. When the uterus has suffered in this way from too vigorous curetting, he combines hypophysis extract treatment with arsenic, tamponing the vagina only in case the hemorrhage is profuse. On the other hand, he declares that the curet should never be used on the uterus merely in treatment of excessive menstruation. The ovaries are usually responsible for this and ovarian treatment is called for, supplemented possibly by tamponing the vagina. He remarks parenthetically, "The present changed mode of life and work seems to have modified in some way the correlation between the uterus and ovary." The second contraindication for curetting the uterus is when the tubes or ovaries are inflamed or enlarged. Curetting the uterus does not remove all the cause in such cases.

Gazzetta degli Ospedali e delle Cliniche, Milan

October 29, XXXVII, No. 87, pp. 1361-1376

103. Experimental Cholemia: Action of the Bile on the Voluntary and Involuntary Musculature and on the Digestive and Urinary Apparatus. A. Berti.—p. 1366.

November 2, No. 88, pp. 1377-1392

104. Gradual Progress toward Improvement in Young Child with Congenital, Primary, Defective Development of Musculature. (Caso di amioplasia primitiva congenita.) A. Nizzoli.—p. 1380.

November 5, No. 89, pp. 1393-1408

105. Roentgen Localization of Metal Foreign Bodies. (La localizzazione dei proiettili di guerra nei tessuti.) C. M. Pavesi.—p. 1395.

106. *Medicolegal Examination of the Hymen. (Esame medico-legale dell' imene.) A. Breda.—p. 1404.

100. **Medicolegal Test for Intact Hymen.**—Breda treats vulvovaginitis in children and virgins by injecting a medicated fluid introduced through a fine catheter worked through the intact hymen. The reflux of the fluid thus injected into the rear of the vagina causes the hymen to bulge outward, and thus shows up its actual condition most instructively.

Policlinico, Rome

November 5, XXIII, No. 45, pp. 1301-1326

107. *Treatment of Mucomembranous Colitis. (Terapia dell'enterocolite muco-membranosa.) A. Capparoni.—p. 1301.

108. Treatment of Syphilis in Women. G. Massimi.—p. 1309.

109. Backache. (I dolori di schiena.) G. Dragotti.—p. 1310.

110. Atrophy of Leg Muscles from Long Wearing of Tight Military Leggings. (L'atrofia della gamba in seguito all-uso prolungato delle mullettiere.) A. Majoli.—p. 1314.

November Medical Section No. 11, pp. 377-408

111. *Auscultation by the Mouth with Percussion of Sternum and Spine in Diagnosis of Disease in the Upper Mediastinum. (Dell'ascoltazione orale. II.) C. Frugoni and G. Tognini.—p. 377.

112. Prophylactic Vaccination against Typhoid and Cholera. C. Moreschi.—p. 393.

113. *Pernicious Anemia. (Contributo allo studio clinico della anemia perniciosa.) A. Roccavilla.—p. 399. Concluded.

107. **Mucomembranous Colitis.**—This affection is frequently mistaken because the patient's description of his disturbances is not clear, and hysteria, neurasthenia, a gastric neurosis or syphilis may be incriminated. Every patient with gastric trouble or neurasthenia should have mucomembranous colitis excluded as one of the first points in the diagnosis. One patient came into Capparoni's hands after she had been treated for seven years for endometritis, to which her dyspepsia, her abdominal pains and nervous disturbances had been attributed. There was constipation, and the afternoon temperature was often slightly febrile. The findings in blood and urine were normal, but the tenderness of the colon gave the clue to the trouble, and systematic dietetic measures, with local sterilization of the bowel, gradually corrected conditions to clinically normal by the end of two years. He warns that milk and fruit and fresh vegetables must be prohibited, as also everything tending to increase the uremia, to which there is usually a tendency in these cases. Among the local measures are enemas, taken reclining, of a 1:1,000 solution of salicylic acid, or a teaspoonful of ammoniacal ichthyol to a liter of water. Dyspepsia should be combated by small doses of alkalines ten minutes before meals. Castor oil is the only purgative permissible; it may be given in a single large dose of 15 gm. with a little belladonna. Iodid and arsenic may be indicated if there is a lymphatic tendency. The nervous disturbances may call for special aid to restore tone to the nervous system, and for this he uses 0.05 gm. phosphorus in 50 gm. olive oil, injecting 2 c.c. daily, keeping this up for three months with intermissions of a month or so. One woman of 35 presented the clinical picture of neurasthenia along with mucomembranous colitis and extreme visceroptosis, all of which subsided under the above treatment. Her health has been good during the ten years since. Another woman of 35 has also been cured for several years to date. She had presented the same clinical picture, and it had been ascribed to hysteria by her physician. She was in the hospital eight months for treatment, and continued the course after she returned home. With mild nervous disturbances, the phosphorus can be given by the mouth. He prescribes it in the form of neutral sodium phosphate. He discusses the various complications and severe types that may be encountered, and the association with gout, migraine, etc., dwelling in particular on the pseudo-appendicitic attacks.

111. **Oral Auscultation.**—Frugoni insists that the ear can be trained to recognize instructive shades of difference in listening at the patient's open mouth while the sternum and spine region are percussed. Enlarged tracheobronchial glands, and tumors in the upper mediastinum modify the findings most characteristically.

113. **Pernicious Anemia.**—In this concluding portion of his article Roccavilla refers to his fourth case of pernicious anemia which was of the rare type of a leukanemic syndrome. He discusses the nature and pathogenesis of pernicious anemia in general, ascribing quite an important rôle to the spleen, but not for the usually accepted reasons. The removal of the spleen leads to a considerable increase in the cholesterin in the blood stream. This is a distinct advantage, he declares, as pernicious anemia is essentially due to a lack or rather a perversion of the blood colloids in general and of free cholesterin.

Riforma Medica, Naples

XXXII, No. 33, pp. 893-920

114. War Surgery. (Appunti di chirurgia de guerra.) G. Marsiglia.—p. 893.

115. Case of Traumatic Hallucinations. V. Desogus.—p. 915.

No. 34, pp. 921-948

116. Color Reactions of Cholera and Other Germs. (Reazioni del vibrione del colera e di altri germi con sostanze coloranti decolorate.) A. Azzi.—p. 921.

117. Fourth Disease; Fifteen Cases. (Malattia di Filatow-Dukes.) E. Donetti.—p. 924.

No. 35, pp. 949-976

118. *The Toxins of Fatigue. (Kenotossine.) L. Ferranini and S. Fichera.—p. 949.

118. **The Toxins of Fatigue.**—This research on the gastrocnemius of frogs was undertaken to determine the modifications in the electric responses after fatigue of the muscle. A large number of tracings are given, the results confirming the depression of the excitability and of the contracting power and general energy of the muscle under the influence of fatigue toxins.

Brazil-Medico, Rio de Janeiro

October 14, XXX, No. 42, pp. 329-336

119 *Iodid Treatment and Intravenous Salicylic-Iodotherapy. A. A. da Matta.—p. 329. Commenced in No. 41, p. 321.
120 *Bacillus Lactis Aerogenes in Brazil; Two Cases. E. Gomes.—p. 330.

119. **Intravenous Iodid-Salicylic Medication.**—Da Matta describes experiences in Brazil with intravenous injections of sodium iodid, all apparently confirming the harmlessness of injection of a 10 per cent. solution. Pereira has reported injection of 475 gm. of sodium iodid in a case of general paralysis in twenty-two injections in the course of forty-seven days, without appreciable disturbances. In Kemplerer's experience, a total of 100 injections of from 5 to 10 gm. of the sodium iodid in a 10 per cent. solution, in different patients, were tolerated without untoward by-effects, at most redness of the face. The injections were made two or three times a week. In some cases of general paralysis he injected from 30 to 50 gm. at a dose, and in other cases he injected 20 gm. daily. When the doses surpassed 15 gm. there was liable to be, a few hours after the injection, slight manifestations of iodism, slight headache, conjunctivitis, etc., which soon subsided. With doses of 20 up to 50 gm. there was slight, transient acceleration of the pulse. Da Matta comments on the difference between the by-effects when given by the mouth or in a vein. By the mouth large doses are liable to irritate the lining of the digestive tract and to induce severe iodin poisoning. For this reason he began in 1914 to give sodium iodid by intravenous injection, and has had no mishap in many dozens of such injections. Doses of 10 or 20 gm. are tolerated by intravenous injection in patients unable to stand the smallest quantity in the stomach. The intravenous injection of a 10 per cent. solution ensures the maximum of advantages from iodid treatment with the minimum of disadvantages. He starts with 5 gm., gradually increasing to 20 gm., repeating the injections daily or every other day or at longer intervals. As a general rule he never gives over 15 gm. at a single dose.

In 1915 da Matta combined sodium salicylate with the sodium iodid, and is enthusiastic over the results obtained with this simple treatment of acute articular and muscular rheumatism and in relieving the pains in many chronic cases of rheumatism and gout. He introduces the needle into a vein in the arm and injects 100 c.c. of the 5 or 10 per cent. solution of sodium salicylate, made with distilled and sterilized water. Then he injects through the same needle 20 or 30 c.c. of physiologic solution and follows this with 50 or 100 c.c. of the 10 per cent. solution of sodium iodid. This has been his practice during the last year at the Hospital de Misericordia at Manaos, Brazil. The patients with acute articular rheumatism lost their pains in a few hours and the pyrexia soon followed. In four cases the results, he says, were marvelous, the patients being able to get up in twenty-four hours. One patient with chronic deforming rheumatism was relieved by a single injection of the pains which had been tormenting him, preventing all sleep. Da Matta gives the injections in a series, the salicylate in 5, 10, 15 and 20 gm. doses, alone or followed by the physiologic saline, and the iodid in doses of 5 or 10 gm., both in a 10 per cent. solution, repeating the injection every second or third day or at longer intervals. When given merely to combat pain, he gives the salicylate in from 5 to 10 gm. doses to 3 or 6 gm. of the iodid.

120. **Cystitis Caused by Bacillus Lactis Aerogenes.**—Gomes' two patients were a young child and a woman who had been kept long on a strict milk diet. In both the cystitis was the work of this bacillus. The woman had been put on a milk diet for slight albuminuria in pregnancy, and the cystitis that developed was accompanied by high fever for fifty days. Under vaccine therapy the woman recovered, but Gomes thinks the suppression of milk had more to do with the recovery than the vaccine therapy.

Semana Medica, Buenos Aires

XXIII, No. 35, pp. 185-222

121 Present Status of Cholelithiasis. (La calculosis biliar.) F. Mastrosimone.—p. 195.
122 Vaccine Therapy of Pneumonia. (Sobre 5 neumococcicas tratadas con el Haptinogeno Neumo Mendez.) J. C. Mira.—p. 211.

No. 36, pp. 223-250

123 Midwives in the Prophylaxis against Venereal Disease. (Sobre profilaxis social de las enfermedades venereas. Participacion de la partera en la lucha preventiva contra la sifilis y la gonorrea.) J. A. Beruti.—p. 223.
124 Infantile Mortality in Mendoza Province. C. Ponce.—p. 231.
125 Blue Vision after Cataract Operations. (La vision azul en los operados de catarata.) F. M. Urra.—p. 240.

No. 37, pp. 251-276

126 Epidemic of Influenza. (A proposito de la epidemia actual de grippe.) R. A. Bullrich.—p. 251.
127 Toxicity of Curare for the Common Frog and Toad and for the Guinea-Pig. B. A. Houssay and E. Hug.—p. 259; (La curarizacion del Leptodactylus ocellatus L. Gir.) B. A. Houssay and E. Hug.—p. 261.
128 Earache. (Breves consideraciones sobre las otalgias.) A. S. Lagomarsino.—p. 265.
129 Concrete Plasmogenesis. V. Delfino.—p. 267.

Russkiy Vrach, Petrograd

XV, No. 38, pp. 889-912

130 Skin Diseases in Wartime. (O bolieznyakh kozhi v voennoe vremya.) V. V. Ivanoff.—p. 889.
131 Medicolegal Expert Testimony in Suits for Divorce. (O sudebnomed. expertizie po brakorazvodnim dielam.) L. Bertenson.—p. 895.
132 Blood Changes Under Influence of Asphyxiating Gases. V. I. Glinchikoff.—p. 900.
133 War Wounds of the Spine and Operative Treatment. (Ognestrieln. raneniya pozvonochnika i ego soderzhimago i ikh chirurgicheskie.) A. L. Goberman.—p. 905.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

October 28, II, No. 18, pp. 1523-1628

134 *The Physiology of Sleep. (Over de physiologie van den slaap.) H. Litwer.—p. 1541.
135 Boerhaave as a Rhymester. (Boerhaaviana. II.) E. C. van Leersum.—p. 1557.
136 *Wassermann Test in Malaria. G. A. Prins.—p. 1562.
137 Contraindications for Trephining the Sclerotic. (Is trepanatie van de sclera gevaarlijk bij tot dichtbij het fixatiepunt voortgeschreden gezichtsveldbeperking?) G. F. Rochat.—p. 1567.

November 4, No. 19, pp. 1689-1768

138 Research on the Tonicity of Muscle and on the Innervation Therefor. (Spiertonus en spiertonusinnervatie. I. Pseudomotorische zenuwwerkingen en tonusinnervatie. IV. Het proefverschijnsel van Sherrington; een pseudomotie der spieren der ledematen, benevens samenvattende beschouwing over pseudomotorische verschijnselen en tonusinnervatie.) G. van Rijnberk.—p. 1689.
139 *Endocarditis Lenta. L. P. Daniels and C. Elders.—p. 1696.
140 The Physiologic Function of the Tonsils and the Tonsillectomy Question. (Het vraagstuk der tonsillectomie.) P. J. Mink.—p. 1703.
141 Boerhaave's Practice. (Boerhaaviana. III.) E. C. van Leersum.—p. 1712.
142 *Present Status of Prophylaxis of Scarlet Fever. (De tegenwoordige roodvonkbestrijding.) L. Heijermans.—p. 1719.
143 Painless Birth of Twins. (Onpijnlijke weeën.) S. Wartena.—p. 1722.

134. **Causation of Sleep.**—Litwer gives the arguments for and against the five principal theories as to the causation of sleep, saying of the vasomotor theory that Spehl denounced it on account of the hyperemia in the brain which accompanies sleep under the influence of chloral, and Mosso found the arterial pressure in the brain high during sleep and lower during waking hours. Richet reported that he sometimes found congestion in the brain and sometimes anemia in the brain during sleep, while there can be anemia of the brain without sleep and congestion without sleep. Hence sleep is not altogether a matter of the circulation in the brain. The inhibition theory explains both hypnosis and ordinary sleep as a psychologic process. It is started by fatigue directly, and, indirectly, by the idea of sleep, by sedative drugs, by electricity, and by extremes of temperature (hibernation). If the psychologic process started by the idea of sleep were all that is necessary, then it might be possible to will not to

sleep. The osmotic theory is based on Devaux' assumption of a connection between fatigue, the necessity for sleep, and retention of interstitial water throughout the body, especially in the brain. Another theory assumes that the neurons retract and thus communication between them is interrupted, but Litwer remarks that it is not proved as yet that they ever communicate directly. His comment on the various theories is that they are all too exclusive; probably there are various factors at work in the production of sleep. Some are more powerful in certain persons and others in others. Sleep at night is probably caused by fatigue and the idea of sleep at night inbred through countless generations. Bouchard's statements in regard to the presence of narcotic substances in the urine are invalidated by the fact that the fluids he used in his experiments had an osmotic tension from two to seven times higher than the body fluids. Litwer repeated his experiments, using isotonic fluids, and was unable to detect any narcotic substances under the conditions of the tests.

136. **Wassermann Reaction in Malaria.**—Prins found the Wassermann reaction positive in four patients with malarial fever, but as the disease subsided the Wassermann test became permanently negative. In another case the persistence of the reaction after recovery from the malaria suggested concomitant syphilis, confirmed by the course of the case. The peculiarly intense response to the test in this case was undoubtedly due in part to the malaria. When a person known to have been exposed to malaria and with no history of syphilis reacts positively to the Wassermann test, Prins regards this as an indication of masked malaria and gives quinin in consequence. The results have always sustained this assumption.

139. **Subacute Infectious Endocarditis.**—Daniels and Elders review the literature on endocarditis lenta and report a case in a woman of 34 with the necropsy findings. She had had acute articular rheumatism fourteen years before. Her present sickness began with pains in the thighs and arms, frequent somnolency, and she tired easily. The *Streptococcus viridans* was cultivated from the blood, and she died in six months with symptoms of mitral and aortic insufficiency.

142. **Prophylaxis of Scarlet Fever.**—Heijermans remarks that scarlet fever is epidemic again in Amsterdam at present, and seems to be spreading more than in last year's epidemic. The scarlet-fever hospitals are overcrowded and barracks are built to shelter those for whom there is no room in institutions. Prompt isolation and placarding of the houses are enforced but do not seem to check the epidemic, and he queries whether this is after all the best means of prophylaxis. We know nothing positive of the scarlet-fever germ and still less of its mode of transmission. All our measures are simply empiric, and their failure to check the epidemic can mean only that they are not effectual as at present applied. The dread of being quarantined and business disturbed leads to concealment of cases; medical help is not sought, and the chances of contagion are multiplied. He emphasizes that measles and whooping cough are far more fatal than scarlet fever, and yet no one thinks of collecting these cases in the hospitals. There was no mortality in the scarlet fever epidemic of last year; it averages 2 per cent. this year.

It is peculiar also to scarlet fever that it is most prevalent among the children of the well to do, entirely the reverse of measles and whooping cough. Children who have had scarlet fever sometimes infect others on returning from the hospital, while there may be no contagion from children kept at home. Every physician knows of children who have developed acute nephritis a few days after their return from the hospital. Another disadvantage of the routine sending to the infectious diseases hospital is the difficulty of a positive diagnosis of scarlet fever. Many children have been sent there who did not have scarlet fever at all. And there is no evidence that institutional treatment wards off complications. Measles requires careful tending more than scarlet fever. Bed rest and dieting are all that is needed for the latter in most cases. Scarlet fever has been of a very mild type in recent epidemics. He thinks it would be much better to have the children kept at home. They are not sick enough to need much medical care. The physician can look in to control the cases once or twice, or certain physicians might be assigned to keep an oversight over all the scarlet-fever cases in the city. In short, he declares that scarlet fever should be managed differently. There should be notification of cases but no placarding of houses. The crowding of scarlet fever cases in the hospitals should stop, and only cases of exceptional severity should be sent to the hospital. The expense of these wholesale preventive measures he regards as a waste of money, at least as long as the epidemics are as mild as they have been of late years.

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November 8, LIX, No. 45, pp. 1085-1108

144 *Tetanus Consecutive to Lesions of the Orbit and Eyeball. E. R. Schneider.—p. 1085.

144. **Tetanus Following Injury of the Orbit and Eyeball.**—Schneider has been able to find only sixty cases of tetanus developing after a lesion of the eyeball or orbit in the literature of the last hundred years. He has himself encountered a case which he here reports, and likewise another unpublished case from the records of the Copenhagen hospital. In 1912 Permin compiled the 371 cases of tetanus known to have occurred in Denmark, but there was no eye case among them. Schneider describes the clinical picture and reviews the literature on the subject.

Ugeskrift for Læger, Copenhagen

November 2, LXXVIII, No. 44, pp. 1931-1968

145 *The Working Capacity with Therapeutic Pneumothorax. (Arbejdsdygtighed hos Pneumothoraxbehandlede.) A. Koefoed.—p. 1931.

November 9, No. 45, pp. 1969-2008

146 Tanning of the Skin and Other Changes in Cadaver Buried in Turfpit. (En ejendommelig Forandring af Lig ved Henligen i Tørvemoser.) V. Ellermann.—p. 1969.

147 *Poisoning with Combination of Causes of Death. (Forgiftningstilfælde med kombineret Dødsaarsag.) K. Sand.—p. 1978.

145. **Earning Capacity with Induced Pneumothorax.**—Koefoed gives the details of thirty-three cases in which an artificial pneumothorax was induced in treatment of unilateral pulmonary tuberculosis. All have been dismissed from treatment for six months at least and the majority for from one to five years. All belonged to the working classes and all are dependent on their own labor for their support, and their employment is under somewhat unhygienic conditions in most of the cases. Their earning capacity is little if at all impaired, but the injected gas is absorbed much more rapidly when the patient is working than when quiet in the sanatorium, and the lung expands again sooner. He says that artificial pneumothorax has been attempted in 200 cases at the sanatorium (Silkeborg, Denmark) but it could be completed in only 110 cases. In this group 31.3 per cent. have full earning capacity. In 37.4 per cent. the progress of the disease was not arrested and the patients have died since. In the ninety cases in which it proved impossible to induce the pneumothorax, 57.9 per cent. have died since, and only 14.4 per cent. are still self-supporting.

147. **Poisoning with Other Causes Cooperating in the Fatality.**—In the first of the two medicolegal cases reported by Sand, there was chronic lead poisoning from the use of white lead by a quack in the prolonged treatment of a skin affection in a child, but pneumonia was the immediate cause of death. It is possible that the lead poisoning may have induced the pneumonia, and it certainly must have reduced the child's resisting powers, and thus have contributed to the fatal outcome. The kidneys showed serious injury from the lead. In the second case the acute poisoning was from the fumes of hydrogen cyanid generated in ridding a room of vermin. A liter of sulphuric acid and 0.5 kg. of potassium cyanid had been used in the room; all the outlets had been sealed except the opening around the water-closet pipe from a bathroom on the floor above. The child had been in this bathroom only five minutes when she was found dead. The child's resisting powers had been depressed by a pulmonary affection so that it was more susceptible to the action of the poisonous fumes.